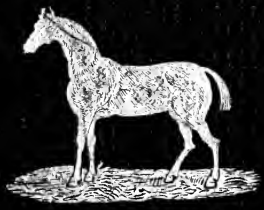

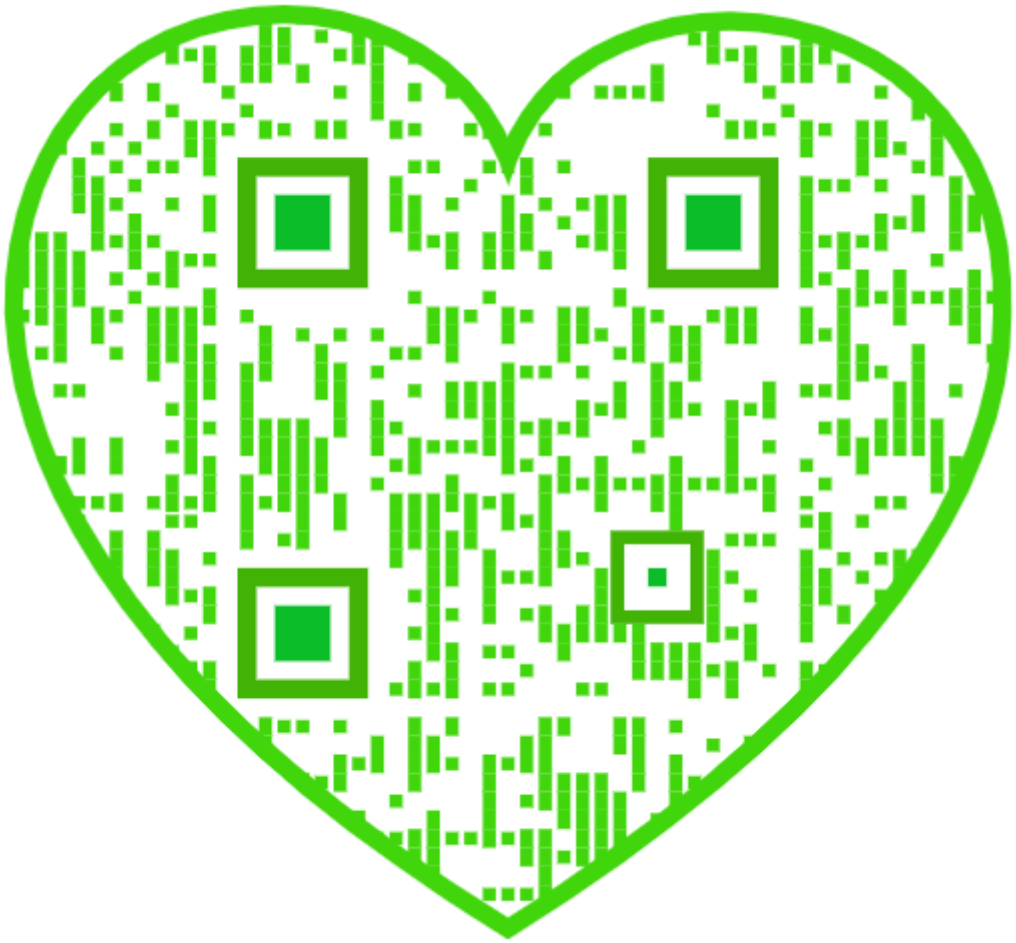

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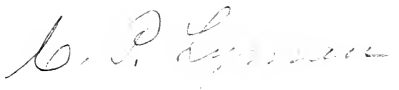

THE FORM OF THE HORSE,

AS IT LIES

OPEN TO THE INSPECTION

OF THE

ORDINARY OBSERVER.

BY

JAMES C. L. CARSON, M.D.

Second Edition.

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PREFACE.

In the commencement of the year 1848, I published a series of Letters on the Horse in the columns of the *Londonderry Standard*. These letters were thrown into a connected form in 1851, and some new matter, in the way of extracts from the writings of more recent authors, having been added, they were published in a separate volume in the year 1859. The favourable reception which this little work met with, at the hands both of the advanced veterinarians and the public, has induced me to issue a second, enlarged, and improved edition. I may say, as I said before, that the conciseness and simplicity of this work must be its chief recommendation. It is intentionally written in that rough-and-ready style, which has the immense advantage of rendering the subject perfectly intelligible to every class of the community.

Coleraine, Ireland,
January 1st, 1862.

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THE HORSE.

THERE was no difficulty about thirty years ago, as I am informed, in procuring a considerable number of sound, strong, active, and safe-stepping horses, in any fair in the province of Ulster, Connaught, or Munster; but the case is so far altered at present, that a person might travel over a wide district of country before he would find one sure-footed, well-proportioned, useful-looking, and really sound animal. It is much to be feared, moreover, that the last observation might be applied with great propriety to a large proportion of England and Scotland. Let a person go where he may, he will find some trouble in procuring a horse of the right stamp—one that is properly adapted to the purpose for which he may be required.

In the days of our fathers, there was an invaluable breed of horses in Ireland, which is now all but extinct. We will never, perhaps, look upon their like again. No judge could avoid admiring them. They had neat and lively-looking heads; light and well set-

up necks; elevated, sharp, and far laid-back shoulders; full and very deep chests; strong, sinewy, and sound legs; good feet; short backs; and all-powerful quarters, which were so placed under them, that they could spring with ease over any fence. Their size, strength, and shape fitted them, in an eminent degree, for the field, the road, and the farm. Besides, they were never trained till they were four or five years old. Their constitutions had then arrived at a pitch of great perfection. The extremities of the long bones were then completely solidified, and, consequently, were less liable to become diseased from the effects of labour than they would have been at a previous period, when in a state of cartilaginous softness.

The severe work to which young horses are now subjected is the chief cause of the present great liabilty to disease. If they were well fed, and allowed to mature their constitutions before being trained, they would, in all probability, remain sound for a considerable time. This, I fear, however, is not likely to be attended to. The *farmer* has so many demands on his purse that he can scarcely afford to allow his horses to roam at large till they reach their fourth year; and the *turfite* finds it more profitable to race his colts at two years' old, than to keep them over, at heavy expenses, until such time as humanity, and a due regard to the soundness of the animals, would point out as the proper period for their first appearance on the turf. The necessities of the

one, and the avaricious disposition of the other, thus render it next to impossible to get good sound stock, either to use or to breed from.

Blood-horses are completely broken down with the severity of their early training and racing; or else, if they continue to run on, and well, for three or four years, they command such enormous prices, that few localities would remunerate the purchaser of a first-class stallion, unless the breeders could be induced to change their present opinions and practice. This, perhaps, is the point at which reform should commence; and I am inclined to think that those parties who keep brood-mares would willingly incur a much greater expense than they do at present, if they were properly alive to, and aware of, the importance of the matter. In general, they have such ill-digested notions on the subject, that they are better satisfied to pay a small sum for the services of a wretched, weedy, useless animal, than to give a remunerating return to the purchaser of a first-rate, sound, and high-priced horse; in fact, they know so little about the POINTS of a horse, that they generally choose the one whose deformities are hid by a mountain of beef. "Such men," says the sensible author of 'The Pocket and the Stud,' "breed from any mare that will breed, get a common country forty-shilling sire, or, if their aspiring thought carries them so high, some thorough-bred one, whose shape, make, blood, and performance, bring him to about the same

price; they thus get a living beast, probably inheriting all the combined imperfections of both parents, put him to plough at two, ride him at three, and at four, provided he will carry you on his back (for mouth or action is, of course, not attended to), he is sold as a 'loickly thing.'"

The system of crossing which has been adopted since the introduction of thorough-bred stallions into country districts, appears to me to be a further cause of the degeneration of our general stock. Let his shape and qualities be good, bad, or indifferent, the one which possesses a sprinkling of blood is sure to be the animal which will be selected as a sire. His light action, showy appearance, and high-sounding pedigree, will be a sufficient recommendation to those who are ignorant of the various *points* and *qualities* which are connected with the strength, substance, durability, and disposition of the animal. Besides, the same horse is certain of being put to a great number of mares of all sorts, shapes, and sizes, without the slightest regard to that exact adaptation of form, in sire and dam, which is absolutely necessary in order to secure a satisfactory result. Breeding from blood-stallions is highly commendable, provided it is done with judgment and discretion; but the practice of *violent* crossing is decidedly objectionable, and cannot be too strongly condemned. "Extremes in crossing," says a writer in the 5th volume of the *New Sporting Magazine*, "are very rarely successful; and it is

really astonishing to see farmers so constantly putting their complete cart-mares to thorough-bred horses, expecting to have foals of a class fit for hunters, whereas nine times out of ten they are fit neither for draught nor hunting; for though they may be up to weight, which is what they expect, there is always a lamentable deficiency of pluck; and the same mare, with a three-parts bred horse, would be likely to produce a very valuable class of horse — the coach-horse." By the practice here referred to, the breeders expect to produce a horse combining both strength and action; but they are very frequently treated to an animal of such a non-descript form, that he is fit "neither for the land nor the sea." In place of being a fair medium between the sire and dam, he will take chiefly after the one in some parts, whilst in other places he will lean entirely to the opposite side; and he is consequently so badly balanced and proportioned, that he is comparatively useless. His temper, moreover, is frequently characterized by a want of conformity to the purpose for which his owner might think him in other respects best adapted.

If a person is to depend upon his own judgment, and wishes to become a successful breeder, he must first make himself thoroughly acquainted with the proper conformation and other peculiarities of the various races, or classes, into which horses are divided. This is the grand secret of success; without this knowledge he may occasionally stumble on what he wants; but

in nine cases out of ten his expectations will be grievously disappointed. I therefore imagine it may serve some useful purpose to place before my readers, whether they may happen to be purchasers or breeders of horses, a concise, plain, and simple review of the POINTS of the horse as they lie open to the inspection of an ordinary observer. Before commencing this task, however, I will make a few cursory observations on the subject of

THE TEMPERAMENT.

Every person understands what is meant by the temper. Not so, however, with the temperament. Nor will I attempt any scientific explanation of it at present, as I could not do so without occupying a great deal of time and space. Besides, it is a very difficult thing to obtain an accurate knowledge of the temperaments; and such knowledge can be arrived at only after minute, careful, and extensive observation. Consequently, I will not enter further upon the subject here than I consider will be consistent with the general bearing and intentions of this essay.

The *temperaments* are usually divided into four—the nervous, bilious, sanguine, and lymphatic. They are never found absolutely pure and distinct from each other, but are combined in different proportions in different cases; and the preponderance of one or more over the remainder will always determine the *constitu-*

tion of the animal under consideration. The success of the Physician will depend very much upon the estimate which he forms of the temperament, or constitution, of his patient; and I cannot see any reason why the same thing should not hold good with regard to the Veterinary Practitioner. The doctrine of the temperaments, I am certain, is equally applicable to the horse, and all other lower animals, as to man; and if it were properly attended to, it would modify the opinions which are currently held upon many points. My only astonishment is, that it has not received a great deal more attention than it has hitherto experienced at the hands of veterinary writers—at least so far as I have had an opportunity of judging, by consulting their works.

The *nervous* temperament is connected with a large development of the brain, spinal marrow, and nerves. From it result quickness of motion, nervous excitability, and constitutional sensitiveness and delicacy. The *bilious* is accompanied with a large muscular system. The muscles, or fleshy masses, are well defined, and both look and feel hard and firm. This state is essentially connected with strength, durability, and sustained exertion. The *sanguine*, as its name imports, has its origin in a large development of the lungs, heart, and blood-vessels. It must therefore be evident, that it is one of no trifling importance. On it, to a considerable extent, depends the nourishment or support of all the

other parts of the body. The *lymphatic* is indicated by large abdominal viscera, and a peculiar disposition to lay on a quantity of fat. The flesh is soft, and the animal is languid, indolent, and sluggish in all its actions.

These, then, are the leading peculiarities of the four temperaments. They will be found in very different degrees of development in the different breeds of horses, and also in different horses of the same breed. The relative proportion in which they exist will have a marked effect upon the peculiar fitness of the animal to the purpose for which he is designed. Any person who takes the trouble of reflecting will easily see the correctness of this observation; and he will also be able to judge which of the temperaments should predominate in an animal intended for any specific purpose. They should all exist, more or less, in the same animal; but the exact balance in which they may be found is a matter of overwhelming importance. For example, activity, speed, and durability, are essentially connected with the nervous, bilious, and sanguine temperaments; and therefore these temperaments are indispensable in the racer, hunter, and roadster. If the nervous predominates, he might possess great speed, but he will be fit only for short distances; whereas, if the bilious occupies the chief place, his peculiar forte will be distance, or bottom. On the other hand, the lymphatic, bilious, and sanguine are more particularly adapted to horses

intended for slow work and heavy draught. If they occur in the order in which I have placed them, the animal will be slow, quiet, strong, and durable. I do not mean to state that any one of the temperaments can be dispensed with altogether in any individual case. The relative proportion which they bear to each other is the point of importance, and it should always receive special attention, as it will mainly determine the qualities of the animal, and, taken together with his form, will enable a person to estimate his capabilities for any particular purpose.

The temperament has a great deal to do with the minute structure of the different parts of the body. If it be active, the texture of the muscles, bones, &c., will be fine, wiry, and compact; if sluggish, the same parts will be coarse, soft, and spongy. This is one essential difference between the Clydesdale and thoroughbred horses in their minute anatomical structure. It should always be kept prominently in view when we make comparisons as to the strength, durability, and other qualities of the different breeds. I will freely admit that the size of any part of the animal is a direct measure of its power, provided all other things, such as temperament, &c., are equal; but I strenuously maintain that the slightest alteration in temperament will make a corresponding difference in the power, and capability of endurance, of every individual part. For instance, the muscle or bone of a thorough-bred horse,

whose temperament is always active, is far stronger, inch for inch, than the same part in a Clydesdale horse, whose temperament is invariably sluggish. If the Clydesdale, Suffolk, or Belgian horse was as strong as he looks, in comparison with the thorough-bred, he would be able to carry or draw a vast deal more than he has ever been known to do. Let us take two animals with exactly the same temperament and the same leverage, and we will invariably find that the one which has the thickest muscle will have the most strength; but if the muscle and leverage are the same in both cases, and the temperaments different, there will be a corresponding difference in power, &c. If comparisons are to be made, they must be drawn with great precision, and this is the proper way to arrive at them with accuracy.

No opinion could be more incorrect than the too generally received one, that a horse draws by virtue of, or in proportion to, his own weight and size. If this were the case, the largest and heaviest animal could always draw the most; and his weight on the bridge would be the best test of his capabilities. But facts in abundance prove it otherwise. There is a small genet in Coleraine, weighing exactly four hundred, two quarters, and fourteen pounds, which has drawn within a few pounds of a ton, besides its cart, for upwards of forty miles, without the slightest apparent difficulty. It has also brought twenty-three hundred

weight of iron a distance of five miles. I have seen a small-sized ass drawing half a ton weight of goods from Portrush to Coleraine. Here, then, are two animals which could draw far more in proportion to their size and weight than any dray-horse that ever was foaled; and this plainly proves that draught does not depend altogether upon weight and size. It is in a great measure the result of a *vital* power. Although weight can render some assistance, the power of draught is chiefly owing to muscular action and nervous energy; which again are intimately connected with, and greatly dependent on, the temperament of the animal. The genet, mule, ass, and blood-horse have much more energetic temperaments than the Clydesdale or Belgian cart-horse, and consequently possess more muscular power than the latter, in proportion to their weight and size. Their leverage, however, is not nearly so well suited for draught, and in that respect, when compared with the ordinary cart-horse, they labour under a decided disadvantage.

Having said thus much regarding temperament, I will proceed with a detailed description of the *points* of the horse; and, for convenience sake, I will commence with

THE HEAD.

The *head* of every horse should be as small as would be in keeping with the rest of his body. A large,

coarse head is a defect in every person's eye, and it has no advantages to counterbalance its deformity. The *muzzle* should be fine, and of a moderate length; the *mouth* invariably deep for receiving and retaining the bit; and the *lips* rather thin and firmly compressed. A fine, tight lip is a pretty sure indication of an active temperament, and consequently affords a measure of the energy and durability of the animal. Horses with short, thick, flabby lips, lying wide apart, are proverbial for sluggishness. The *nostrils* should be large, so as to be capable, when open, of allowing the air to have free access to the lungs. In conformity with the uniform condition of the Creator's works, it will be found that there is a direct relation between the development of the nostrils and the capacity of the lungs for air. Hence arises the necessity of observing the size of the nostrils. Capacious lungs would be of no use, if the orifice which connects them with the external atmosphere were so contracted that they could not get properly filled. The race-horse must have very wide and dilatable nostrils to admit a large volume of air, with the utmost freedom and greatest speed, into his widely and rapidly distended lungs; but the horse of slow work can take more time in his breathing, and consequently does not require such a very large nostril as the racer, hunter, or steeple-chaser. Care must always be taken, recollect, not to confound a naturally well-developed nostril, with one which looks large in consequence of

having been kept in a state of permanent distension by disease of the lungs or air-passages. The *muzzle* ought to be fine a good way up, and then the parts should enlarge suddenly, in order to give plenty of breadth to the under-jaw, as well as thickness from side to side. This is a point of great beauty, as it gives breadth to the jaw-blade and breadth from eye to eye, whilst the fineness of the head generally is maintained. A head that is narrow between the eyes, and narrow on the side of the jaw, is painfully disagreeable to the eye of every judge. The *space* between the two blades of the under-jaw ought to be so broad and so deep, as to freely admit the lower edge of the neck when the chin is reined in towards the counter; but it should not be wider than this, as it would then appear coarse. If there is sufficient room in this locality, the horse can be reined up to the proper pitch without stopping up his windpipe. The *face*, on a side view, should be dipped in the centre between the eyes and the nose. This is generally the case in the Arabian and English blood-horse, and it is a much more beautiful formation than either the straight or convex profile. However ornamental it may be to the human face, a Roman nose certainly does not improve the appearance of the horse. The line of beauty in the one case is very different from the other. A dish-faced horse is admired on all hands, but a pug-nosed man, with a projecting, upturned chin, will have some difficulty in carrying off the prize for

beauty. The face must be very broad between the eyes, but it should taper a little as it approaches the ears. If the breadth is carried all the way upwards, the top of the head will be too wide, the ears ill set, and the horse probably sulky.

As in the human being, so in the horse, a great deal of the expression of the countenance depends on the *eye*. It is a most marvellous index to the working of the mind within. A glance at it will often reveal the benevolent feeling, the sulky disposition, or the vicious propensity that is about to manifest itself. The reason of all this must be obvious, when we remember that it is in direct communication with the brain—the material instrument through which the mind operates. The eye of the horse should be kindly, strong, bold, and fiery, yet gentle looking. It should not show much white, as that often indicates a vicious disposition. A horse that is looking back so far as to expose the white of his eye, is generally on the alert for mischief, and is not to be trusted with his heels. The absolute size of the eye is said to be nearly the same in all full-sized horses; but its apparent size differs greatly in different cases. This difference is owing chiefly to its forward or backward position in the socket, together with the thinness and openness of the eyelids. The eye should be well set out in a prominent socket, yet not so far as to be exposed to external injury. It gives a strong indication both of the temper and temperament of the

animal. It is easy to judge from it whether activity or sluggishness prevails most.

The *ears* should be long, fine, and very active. They ought to be firmly and rather closely set on the top of the head. If they are coarse, wide apart, low-set, and drooping, they will give a nasty, indolent, and heavy appearance to the horse. There could be no greater ornament than long, fine, active-looking, upright, tolerably close-set ears, with the points a little inclined towards each other. I never saw a soft-constitutioned horse with ears of this description.

An examination of the ears, eyes, and lips will enable us to estimate the temperament of the horse with a tolerable degree of accuracy. The colour of the hair should also be taken into account, although it has frequently been said that a good horse is never of a bad colour, or, in plainer language, that it matters not, beyond the mere item of taste, what his colour may be. This, I imagine, is a decided mistake, as the colour of the hair has as much to do with the temperament of the horse as it has with the temperament of a man. Observation has led the public to this conclusion practically, as is proved by the every-day saying, that such or such a horse is of a *hardy* colour. How seldom do we find a jet black or a wishy-washy chestnut with as much pluck as a rich chestnut, a deep-blood bay, or a dark brown! The former colours are generally connected with soft, scrofulous con-

stitutions, whilst the latter as often indicate fineness of texture and capacity for endurance.

To the part of the head, between the eyes and the ears, which is occupied by the brain, I, as a phrenologist, and from practical observation, attribute very great importance. I have never yet seen a horse with a sweet temper and tractable disposition that was very flat, or hollow, in the part of the forehead which lies immediately under the front strap of the bridle, provided, at the same time, he was unusually wide between the ears. A horse of this description will be savage, sulky, and ill to train. You will be constantly teaching him, and after all he is never properly taught. I know (1848) a stallion with this defect, and he has transmitted it to all his progeny which have come under my observation. They are mostly all manageable to a certain extent, but I never saw one of them brought to have a comfortable, silky, gentle disposition. On the other hand, a horse with a moderate breadth of crown, and a very prominent forehead at the region of the brain, will be good-natured, kindly, and docile. He can be taught anything, and when once trained, he is trained for life. Hence the necessity of teaching him gently and carefully at first, as the habits which he may happen to acquire at the start are seldom ever eradicated. Let it be particularly observed, however, that an extremely narrow skull is by no means desirable, as the horse would then be so timid,

that he would be a source of constant annoyance to his rider. A medium breadth at the base of the brain, with a prominent forehead, is the best development of all, because it is the concomitant of courage and good-nature, which are essential to our comfort and safety.

Some parties may think these notions are visionary, but I am confident they are founded in nature, and will be fully borne out by careful inspection and observation. I disregarded them in one instance lately, and, contrary to my better judgment, purchased a mare whose shape and action attracted my attention. In the course of a short time, however, I found out my mistake, and was obliged to "pocket my loss," as a reproof for my temerity in running counter to the plain and unerring laws of nature. I do not mean to say that all trained horses, with certain marks which I have mentioned, are quiet and tractable, because many of them are trained by beings far more savage than themselves, and the best temper may thus be spoiled; but what I state is, that a horse with a certain formation of brain is *by nature* gentle and docile, and will become ill-natured and intractable only by brutality and bad management. If any of my readers are inclined to judge for themselves in this matter, and wish to put it to the test of practical observation, I would suggest that they must be very careful to ascertain the exact position of the parts which I have referred to. The development of the *brain* is the thing to

be attended to; and the best method of becoming acquainted with its locality is to open the skull of a dead horse, and then examine the points at which the brain can approach the surface. In this way they will be prevented from mistaking a projection of bone for a prominent brain, and they will not be likely to look for a protuberance of brain where no brain should exist.

THE NECK.

In all horses, the neck should be fine and arched-looking where it joins the head. Fineness in this locality adds greatly to the beauty of the horse, and generally speaks well for the purity of his breeding. The setting-on of the head and neck should be such as to cause the nose to project a little forward, otherwise the head will look no better than it would if it were nailed across the stump of a tree. Still the nose must not be pushed so far forward as to constitute a star-gazer, as the horse would then be both unsafe and unmanageable. A star-gazing horse may run where he pleases with his rider, because the bit will slip up into the angles of his mouth, in place of keeping a solid and safe purchase on the lower jaw; in fact, the anatomical relations between his head and neck are such, that his chin can never be drawn in properly towards his counter.

In place of being an objection, it is rather an advantage, that the windpipe should be large, and rather

loosely attached to the parts over which it passes. This arrangement will increase the freedom of breathing when the head and neck are stretched out in the gallop, at the same time that the appearance of lightness is preserved. When the windpipe keeps free and distinct all the way from the head to the chest, the neck will look thin and graceful.

The length and thickness of the neck may vary a little, according to the purpose for which the horse is intended. The racer, the hunter, the roadster, and the harness-horse, should have the neck a little longer, and considerably lighter than the carter; but still length and lightness must not in any instance go to too great an extreme, as that would be indicative of constitutional weakness. In all cases the upper edge of the neck must be thin, and it ought to be arched from the seat of the collar forwards, or else the shape should be such, that it can easily be thrown into an arch when the reins are drawn moderately tight. The under edge will be thin and graceful-looking, if the windpipe is sufficiently distinct and detached from the adjacent parts. The centre should be much thicker than either the upper or under edge, and it must increase in thickness as it approaches the shoulder. If this is not the case, the horse will most likely be generally defective in muscle. The curve of the under edge must bear a proportion to the curve of the upper — more especially as it approaches towards the head. Nothing can be more

unseemly than a horse whose neck, when reined up, presents a straight line all along the top, and a convexity at the under edge. He is then said to be ewe-necked. A horse with a neck of this description might be a good one, but he can never be a handsome one; in short, a nice, finely set-on head, and a tolerably long neck, arched in such a way as to form a convexity above, and a concavity below, would add to the beauty, and most materially increase the value, of any horse.

The manner in which the neck is attached to the shoulder is deserving of special consideration. In every case it should be set well up on the shoulder, so as to allow a convenient seat for the collar below, and thus avoid pressure on the windpipe, or abrasion of the skin. This arrangement will also assist in making the horse light in hand. In the heavy draught-horse, the junction of the neck and shoulder may be strong and thick throughout; but in all other instances the spot on which the collar rests above, in front of the shoulder-top, must be hollowed out. This I insist upon as an indispensable requisite in a horse for the saddle or light harness. Such a conformation enables the rider or driver to raise the head of the horse to a considerable height without altering, to any great extent, the position of the shoulders and body; whereas, if the neck were strongly and fully made up at this point to the level of the shoulder-top, the head and neck could not be raised without raising, at the same time, the shoul-

ders and body of the animal, which operation would require a man of more than ordinary power, as he would be obliged to lift a great portion of the horse's weight, in addition to a share of the load that might happen to be on his back at the time. I should like to see the man who could recover a stumbling horse whose neck was fully made up, and firmly united to the shoulder-top. If the shoulder is tightly bound in this locality, the animal has little control over it, and, consequently, when he makes a mistake, he can do little towards recovering his equilibrium. He cannot properly be called a tripper, as he is sure to go down all of a piece. I am particular in insisting upon this point, as I have so often observed men who were not in the habit of riding much, but pretended to be great judges, taking exception to the best formation, and praising those animals which were particularly faulty at the place referred to, because they considered them so strong and well made up at the front of their shoulders. In many instances it is vain to tell these individuals that their ideas are erroneous, because they have little practical experience, and are such perfect judges in their own estimation that they require no instructions on the subject.

The shape and position of the neck should be particularly observed by the person who trains, rides, or drives the horse. It is rare to see two horses formed so exactly alike, that they can bear to have their heads

elevated to the same height, without painfully interfering with the action and power of all parts of the body. How unseemly and how barbarous is it, then, for some ignorant trainers, riders, and drivers, to screw up all the horses, no matter how diversified their shapes, that unfortunately fall into their hands, to the same point, for the purpose of giving them what they are pleased to call a graceful carriage! Do such people ever imagine that gracefulness results from a peculiar and appropriate adaptation of the different parts of the animal to each other, and not from a partial distortion, such as we often see exhibited under the influence of the heavy bit, or that most brutal invention, the bearing-rein? Were it not for its cruelty, it would be very amusing to observe the manner in which some men in riding or driving prop themselves up, for the purpose of pulling, with might and main, at the poor animals' mouths, in the foolish hope of being thus able to keep them from falling, at the same time that they render them so much more attractive to the passers by. Their task is certainly a very anxious and laborious one, and, if persevered in, it is sure to end with broken knees, and, perhaps, a broken nose. The horse is placed in such an unnatural position, that his entire action is interfered with, and he gets such a habit of leaning on his bit, instead of watching for himself, that he is nearly certain of dropping the first moment his governor forgets the pulling process. A sweet rein,

with a quick hand, will have far the best chance of keeping a stumbling horse on his feet. He will then depend on his own vigilance and exertion, in the same way as he would if he were running at freedom through a field. The head and neck of every horse should be raised just into that position which will comport with the exact balancing of all the other parts of the same animal. The poor creature will then be permitted to do his work with gracefulness and ease, and the feelings of the on-looker will not be harassed by the compassion which he must feel for a noble animal that is constrained to assume an unnatural and intensely painful attitude.

THE CHEST.

THE blood, which is circulated by the heart, and is purified and vitalized by the reception of atmospheric air in its passage through the lungs, is the only source from whence the different parts of the body can derive nutrition. Hence it becomes a matter of vital consequence, that the cavity of the chest should be of such a shape and size as to afford perfect accommodation for its precious contents—the heart and lungs. In a state of quiescence, the blood circulates slowly, and respiration is performed with ease; but an increased exertion is invariably accompanied, in a direct ratio, by a quicker breathing, and a more rapid transmission of the vital fluid, in order to make up, by the process of nutrition,

for the waste produced by exercise. Further, we must bear in mind that the blood which has been sent round the course of the general circulation to the heart, from whence it started, has served its purpose, has become impure, and is no longer capable of sustaining life, until, after having received additions from the digested food, it is again passed through the lungs, in which it comes in contact with the air inhaled for the special purpose of its purification. Every pound of blood circulated by the heart must receive a stated quantity of air in the air-cells of the lungs; and, as the rapidity of the circulation bears a direct relation to the amount of exertion endured within a given time, it follows, as a matter of course, that the capabilities of the horse must depend, in no small degree, upon the capacity of the lungs for air. Hence arises the necessity of paying special attention to the size and shape of the chest, in which the heart and lungs are placed.

Without entering upon a minute anatomical description of the CHEST, I may just say, that it is bounded in front by the neck, on each side by the ribs and shoulder-blade, below by the breast-bone, above by the spine, and behind by the diaphragm which separates it from the bowels. A line drawn from the region of the kidneys, immediately behind the saddle-seat, and terminating at a short distance behind the girths at the breast-bone, will point out, with tolerable accuracy, the position of the diaphragm. It is a large expansion of

muscular tissue, and stretches across from side to side in such a way as completely to separate the body into two great cavities. By its motion backwards and forwards, either of these cavities can be lessened or enlarged as circumstances may require.

The large cavity called the chest, which intervenes between the boundaries specified, is occupied almost entirely by the heart and lungs. The size of the heart alters little at different periods in a state of health. Not so, however, with the lungs. They are very elastic in their nature, and consequently are capable of being greatly collapsed, or enormously distended, at certain periods, during the process of respiration.

When the demand for breath arises, the ribs are elevated, and the diaphragm is drawn back, for the purpose of enlarging the cavity within. The lungs, being elastic, immediately start up to fill the expanded chest; and the atmospheric air rushes into the now open air-cells of the lungs, from whence it passes into, and purifies, the blood. So soon as the inhaled air has been exhausted by the blood of its vitalising principle, it is thrown out again by the pressure of the diaphragm and ribs (whose action ceases) against the lungs. The lungs are then reduced to their original size, and the capacity of the chest is diminished. This constitutes the process of respiration or breathing, and on its due performance will chiefly depend the health and usefulness of the animal. A horse calling "bellows-to-mend" is

fit for little. He may drag out a miserable existence at slow work, but he is totally incapable of very active exertion. "Wind," says a sensible old turfite, "is the grand secret of a good race-horse. Good lungs will cover a multitude of faults, as disproportionate as ugly; whilst, on the other hand, perfection of shape and form are useless when the wind is out." The shape and size of the chest are, therefore, matters of no trifling importance; because they will, in a great measure, govern the condition of the lungs.

In every case the chest should be large and capacious; but its exact shape may vary a little according to the purpose for which the horse is required. In the animal for slow work and heavy draught, it may approach towards the circular form, because this shape is generally accompanied by great bulk and strength for the collar; whilst, at the same time, sufficient expansion can take place to accommodate the slow and regular action of the lungs which is required at a walking pace. This sort of horse, however, is quite unfit for any kind of work requiring speed. As Mr. Youatt very properly remarks, "He would not do for ordinary quick exertion, and if he were pushed far beyond his pace, he would become broken-winded, or have inflamed lungs." Let it be particularly observed, moreover, that even in the draught-horse the chest should be deep as well as round, in order to afford sufficient space for lungs of the proper magnitude. Depth of chest is not so much

sought after as it should be in the cart-horse; and hence it is no unusual thing to see people breeding from animals which are very faulty in this particular. A horse with a shallow chest is not desirable for any purpose.

In proportion as we pass from the draught-horse, through the different degrees of speed, up to the racer, in the same proportion must the depth of the chest, when compared with its roundness, increase. The horse for harness should have a round and deep chest, the roadster and hunter deeper still, and the racer or steeple-chaser should be almost as deep as a greyhound, at the same time preserving a fair proportion of breadth. Depth of chest is indispensable for speed combined with distance.

The reason of all this is very obvious, for, as Mr. Youatt observes, "the circular chest could not expand, but every change of form would be a diminution of capacity," because "the circle is a figure which contains more than any other of equal girth and admeasurement." A simple experiment will illustrate this proposition. Take, for example, a piece of pasteboard, and form it into a cylinder about six inches in length and two inches in diameter, leaving it open at both ends, so that it can be compressed equally from end to end. Place one end on a table, and compress two of its sides until the cavity assumes a perfectly oval or elliptical form, and then fill it accurately with fine shot.

When it is nicely filled and levelled on the top, remove the pressure from the sides, so that the pasteboard may again form a perfect cylinder, and it will be found that the shot is not nearly sufficient to fill the cavity. Now, as the quantity of pasteboard remains exactly the same during the entire experiment, it is quite plain the change of capacity is owing solely to the change of form.

Let us suppose, then, that a horse has a perfectly circular chest, and it will follow, as a necessary consequence, that the elevation of the ribs on the side, in place of increasing its capacity, will actually lessen it, by bringing it more or less into the elliptical form. In this case the cavity of the chest would be larger when the breathing would be suspended than at any other time, because its original shape was such as not to admit of an increase of size by any change of form. The farther it would be changed from the cylinder, the smaller it would become. But if, in the first instance, the chest were a great deal deeper than broad, the elevation of the ribs on the side would just serve to bring it into the circular shape, which is the most capacious of all. Hence it must be evident, that depth of chest is indispensable in all cases.

As the lungs of the horse occupy a much larger space when he is in active exercise, than when he is at rest, we are justified in concluding that he requires to have the power of increasing the size of his chest in

proportion as he is called upon to increase his speed. Contrary to the popular opinion, the chest must, to a certain extent, be flattened on the sides, in order that it may be capable of being changed from the elliptical into the circular form. The horse for very slow work may have his chest approaching the circle, because the trifling elevation of rib which is required by his quiet mode of breathing will only be sufficient to complete the circular shape. Whilst he may do with this kind of chest, it cannot, however, be considered advantageous, as a greater power of wind might often be of decided service to him, and could never be injurious. The depth of the chest, when compared with its width, must invariably increase in direct proportion to the increase of speed and distance required of the animal. In the steeple-chaser, or the flat-racer, it should be of enormous depth, in order that the elevation of the ribs may assist in forming a capacious circle, for the purpose of accommodating the rapidly and frequently distended lungs during the trying period of the race. In such cases a round chest would be of no use, as the wind would be completely pumped out of the horse before he had gone half the requisite distance.

If we wish to form a correct estimate of the dimensions of the cavity of the chest, it will be necessary for us to make a minute and accurate examination; a partial inspection will not do. The direction of the ribs, as they spring from the back-bone, must be par-

ticularly attended to. If in place of being arched above, they come sloping down like the roof of a house, the upper part of the cavity must be greatly narrowed, and the horse is said to be herring-ribbed. This is a great defect, inasmuch as the form of the ribs near the back-bone will not permit such an elevation as would be sufficient to change the upper region of the cavity of the chest from the elliptical to the circular shape. The extent of motion in this region is exceedingly limited, and consequently the ribs, in their quiescent state, should be very well rounded here. In every horse they should come right out for a considerable distance from the back-bone, so as to present a broad and flattish surface above. The condition of the parts will be best observed by looking over the back from behind.

The part upon which the saddle rests, immediately behind the shoulder-top, should always be examined. It ought to be well filled up, so as to place the saddle in a comfortable position. If there is much of a dip in this locality, the ribs will encroach upon the size of the chest, and the action of the horse will be greatly impeded by the constant shifting of the saddle on the tops of the shoulder-blades. This is a common and exceedingly annoying defect. It can be remedied only by the use of the patent saddle-cloth, or by the antiquated plan of keeping the saddle in its place, by means of a crupper attached to the poor animal's tail.

Where the ribs commence their descent on the side, hey should either preserve a tolerably rounded shape, or become moderately flattened, according to the use for which the horse is intended. The circle, however, must be resumed as they approach the breast-bone below, for the purpose of giving breadth to the floor of the chest. The chest of the draught-horse ought to be large every way, but it, even, should be considerably deeper than broad.

The power of motion possessed by the parieties of the chest is greatest on the side, much less at the breast-bone, and very limited, indeed, at the region of the back. Now, as it is desirable, during the period of a full inspiration, to bring the entire cavity of the chest as near as possible, for reasons already explained, into the form of a circle, it follows that, in a quiescent state, the part next the back, which is the least moveable, should be the most circular, the part next the breast-bone a little less so, and the sides, the most moveable of all, much less so still. Hence it is evident that every horse for fast work, such as the roadster, steeple-chaser, or flat-racer, must have his chest wide above, tolerably wide below, and a little flattened, but very deep, on the sides. If he does not come pretty well up to this form, he will not be able to go the pace for a long distance. He might have plenty of speed for a short spurt, but a couple of miles at a rattling pace would shut up his wind.

Observe, I do not advocate a chest as thin as a lath; I must have it big every way, but with the relative proportions mentioned. If it follows this development, the elevation of the ribs will form a most enormous cavity for accommodating the highly-elastic and widely-distending lungs, during the period of a rapid and deep inspiration. This is exactly the shape of the chest in that model of beauty, the greyhound; and where is the animal of the same size could go the pace and keep up the steam with him? A well-formed greyhound is one of the most beautiful and interesting pieces of machinery in nature.

As the parieties of the chest are nearly fixed above, and not very free below, how does it come that the ribs, most of which are attached at both ends, can move with freedom? They might have a trifling motion from below; but they certainly could not have a sufficiently extensive range of action, were it not for a peculiar and most beautiful contrivance, by which they are permitted to have a sort of lateral elevation on the side from behind forwards towards the shoulder. Their power in altering the shape of the chest is chiefly owing to the peculiarity of this arrangement; but as I could not explain it satisfactorily, unless it was illustrated by a practical examination of the parts on the dead subject, I will not enter farther upon it in this place.

The breadth of the chest may be estimated by the

width of the counter, and by the fulness of the ribs behind the foreleg and shoulder. A depression of the ribs at the part where the leg is united to the shoulder, has a material effect in lessening the breadth of the floor of the chest.

The counter should be broad and weighty in the cart-horse; but its breadth ought to decrease in proportion as we wish an increase of speed. This, of course, must be understood within certain limits, as the race-horse, the swiftest of all, should not have an extremely narrow counter. His should be narrow only in comparison with that of the cart-horse. If it were extremely narrow, the chest would be light and the shoulders weak, and the forelegs would be so close together that there would be every probability of an interference in the region of the feet and pasterns. The counter of the race-horse should not be on either extreme. It ought to be broad enough to give substance to the shoulders, and capacity to the chest, without adding too much weight to the fore-quarter, or separating the legs so far from each other as to give a round and lubberly action to the horse in the trot or gallop. In all cases, the counter must be well supplied with strong and prominent muscles.

The sternum, or breast-bone, which forms the floor of the chest, requires to be long. It ought to drop low both between and behind the legs. There is nothing more to be desired than a long and well let-down sternum, as it

adds to the cavity of the chest both behind and below, at the same time that it throws the girths of the saddle far back, into a comfortable position. A shallow-chested horse may answer a very good purpose over a half-mile course, where speed is of much more consequence than bottom; but he would have a poor chance, in a four mile race, with such horses as Harkaway, Chanticleer, Van Tromp, and the Flying Dutchman, whose immense chests would enable them to go a good pace from end to end without getting out of wind. No shallow-chested horse, it matters not what his speed might be, could live with any of these over a long course, with heavy weights. If these remarks are correct regarding the flat racer, they surely are equally applicable to the hunter and steeple-chaser, who are frequently obliged to go over several miles of heavy country, at one burst, with such weights, and at such a pace, as would be sufficient to test the wind of the best horse that ever stepped on iron.

Before leaving this part of my subject, I may just state that, according to my observation, the best way to ascertain the condition of a horse's lungs is, to take him fresh from the stable and run him quickly down, not up, a hill. The pressure of the liver, stomach and bowels, through the diaphragm, on the lungs, will very soon tell, by the presence or absence of a cough or a sneeze, "what way the wind blows." The ordinary method of running him up the hill may be a

proper test for roaring or whistling, but it is not so certain a criterion for a cough as the plan I have suggested.

It may be well, perhaps, previous to the consideration of the shoulder and foreleg, to make a few observations on the nature and uses of the bones and muscles.

THE BONES

are composed of a hard, dense, and inflexible material. They are found either in rough, irregular, and flattened masses, which are intended to serve for the origin and insertion of muscles, as well as to incase and protect the internal vital organs, such as the brain and spinal marrow, and the thoracic and abdominal viscera; or else they are rounded and elongated, as in the legs, to act as convenient levers for the propulsion of the machine. Their texture differs greatly in the different breeds of horses. In the thorough-bred, they are remarkably dense; whereas in the dray-horse, they are open and spongy. This is one reason why the strength of the bone in the blood-horse is generally undervalued. It is never considered strong, at least by the public, because its circumference is less than it is in the carter. There is a mistake made here, however, in forgetting that the texture of the one is much more dense than that of the other, and consequently that, inch for inch, the bone of the blood-horse is much heavier and more substantial than the bone of the

carter. If we wish to make an accurate comparison, we must keep up this distinction; or else compare two animals belonging to the same class. In the latter case, the texture is nearly alike; and therefore the one which has the thickest bone should be the strongest, as far, at least, as bone is concerned.

Any person who wishes to test the correctness of the above statements, can easily do so by burning the shank-bones of a thorough-bred and a Clydesdale horse. When the animal matter is consumed, the remaining earthy portion will discover the texture. For the sake of accuracy, however, it will be necessary to choose the shank-bone in each case, because the various bones in the same animal differ very much in their porosity, according to the locality in which they are placed, and the purposes for which they are required.

No man, let his pretensions be what they may, can be a real judge of a horse, unless he is aware of the position which the bones of the skeleton occupy. They are the levers of the whole machine; and on their length, shape, and position will depend, in a great measure, the fitness of the animal for the purpose he is designed to fulfil. "The first requisite," says Mr. Cawse, in his treatise on the art of painting, "for drawing the horse, or any other animal, is to acquire a knowledge of the skeleton, as on that depends the power of making a good outline. The first sketch of a horse should always determine the exact situation of

the bones, in regard to their length and proportion." These observations are very just, and should be kept in mind by every person who undertakes to *judge* a horse. If such things were properly understood and attended to, the *fat* porpoise would not carry away the prize so often as he does.

In looking over the numerous plates of horses which are published, I have frequently been surprised to see the great dissimilarity which exists between the different plates of the same animal, when drawn by different artists. This is often the case, even although the artists are of the highest standing in their profession. I do not attribute the defect to a want of natural talent on their part; but I am decidedly disposed to think it is owing either to a defective anatomical and physiological knowledge of the animal, or to a neglect in placing the horse, during the time he is under observation, in that exact position which throws all the bones and muscles into an harmonious attitude. But even supposing the horse is standing in a proper position, an extra stroke of the pencil on an important bone, muscle, sinew, or joint, would spoil or rectify the whole. It must, therefore, be evident that an accurate and minute anatomical and physiological knowledge is indispensable. It is also important that we should get a side view of the animal. Our position for examination should be a little behind, rather than before, the centre, as the slightest deviation from this would alter

the appearance of the hind and fore quarters. I need scarcely observe, that the man who attempts to give an accurate and faithful likeness of a horse, in any other than a standing posture, deserves more credit for imagination than discretion.

THE MUSCLES.

The reddish-coloured substance which is commonly called flesh, is not thrown over the bones in an irregular and uncertain manner; on the contrary, every fibre of which it is composed takes a specific direction for a specific purpose. The fleshy fibres, or threads (such as may be seen in a piece of dried beef), are thrown together into bundles of various sizes. These bundles, or masses of flesh, are called muscles.

The muscles are very numerous, amounting to hundreds, and every one of them is running towards some particular point, for a special use. On a cursory examination, they may appear complicated and irregular in their arrangement, but a more minute inspection will discover the most beautiful and suitable design. Their importance is so great, that they cannot be dispensed with; it is by their means alone the bones are put into motion. They are frequently terminated at one extremity by dense cords, called sinews. These sinews are very strong, and incapable of being stretched. If they were elastic, they would be quite useless. In-

stead of stretching under the action of the muscles, they are sure to move the bones to which they are attached, and they thus become a most useful instrument in the act of progression.

The fibres, or threads, of which the muscles are composed, are so arranged that they can contract upon themselves to such an extent as to shorten the distance between their extremities by *one-third of their whole length* (Bostock). This is a fact which must be kept steadily in view, as the action of the animal is greatly influenced by the length of its muscles. For example, if the muscles which move the leg in one horse are double the length of those which perform the same duty in another horse—and if in each case they contract or shorten themselves by exactly one-third of their own length—it must follow that the horse with the long muscles will cover double the space, at each stride, that his opponent can do. The advantage of attending to this point will be fully illustrated as I proceed.

THE SHOULDER.

THERE is no part of the horse receives so much attention from the public as the shoulder, and yet I fear the views which are entertained regarding it are not generally correct. The fact that it should vary in shape according to the purpose to which the horse is to be applied, is too often overlooked. The carter and

the racer should differ considerably in this particular point; the shape which would suit the one would be worse than useless to the other. In this respect they are diametrically opposed.

The heavy draught-horse requires an upright, thick, and very weighty shoulder. This conformation will give him as much muscular strength, "and weight in the collar, as will be sufficient to assist the hind-quarters in moving his enormous load; besides, the upright shoulder will fit the collar so accurately throughout, that there will be a distribution of pressure over the whole surface," in place of being confined to the spot from whence the draught commences.

The lighter draught-horse should have a strong and thick, but moderately-slanted, shoulder, with an elevated wither. This will enable him to step lightly, freely, and actively in his varied operations, whilst sufficient strength and weight are retained for the sort of draught to which he is put. He will be a strong, and yet very handy sort of horse, for a variety of operations about a farm. As his shape does not confine him to one particular sort of work, he will be found generally useful. He will have more speed, lightness, and activity, especially in turning, than the dray-horse, although he may not have so much strength for a straight, heavy pull.

In the hunter, the withers ought to be high, and the shoulder well laid back. The high withers will ma-

terially assist in raising his fore-quarters over the fence, whilst the slanting direction of the shoulder will increase his stride in the gallop. He will also be light in hand (the neck must be hollowed out in front of the withers, as already described) and safe to ride, as the backward position of the saddle-seat will throw the rider's weight to a proper distance behind the fore-leg. If the rider were placed directly over the fore-leg, as he would be with an upright shoulder, it would be impossible for the horse to recover his balance in case he might happen to make a stumble. The lowering of the fore-quarters during the stumble, would place the weight of the rider in front of the leg, and then it would be out of the question for either the man or the horse to make a recovery; they must inevitably go down. Besides, if the horse never stumbled, the position in which he carries his weight would be very unfavourable for his action in the trot or gallop, as he could never draw his hind-legs, from which alone he pitches, sufficiently far forwards to get them, as a fulcrum, under his rider. His action would be so much interfered with by the weight on his shoulders, that he would be easily fatigued, if kept at a fast pace.

There should be no difference in the shape of the shoulder between the roadster, the hunter, and the steeple-chaser. They all require the same sort of action in the fore-quarters. But the flat-racer differs from them in one point — he should not be so high on

the withers. In his case speed is a thing of primary consideration, and therefore he requires to run close to the ground, which he could not do if his withers were very much elevated. If he runs close to the ground, there will be little time lost in his stride; and this is surely of immense importance, when one moment may determine the result of the race. Eclipse was quite as high on the top of the rump as on the shoulder, and so should every race-horse. An old turfite (*Sporting Magazine*, vol. i., New Series, p. 120) says, for speed he prefers "the whole form lower before than behind." Be this as it may, one thing is certain—the withers should not be higher than the top of the rump. A race-horse whose form is higher before than behind, will have a high and roundish sort of action, which may please the inexperienced eye, but the good judge will always consider it far inferior to the long, low, sweeping, swimming stride of the low-shouldered horse who runs close to the ground.

Some parties may probably think me astray when I say, that not only the gig-horse, but the carriage-horse also, requires a well-slanted shoulder. However, I ground my opinion on the fact, that the fashionable carriage now-a-days is a very different machine from what it was in the last generation. At present it is built as light as possible for fast work, whereas formerly it was a fair load for four horses. Nevertheless, the carriage or gig-horse may do very well

with a shoulder a little less slanted than the saddle horse.

The shoulder contains two important bones imbedded in a mass of strong muscles. One of these is called the *scapula*, or shoulder-blade, and the other is called the *humerus*.

The scapula runs from the point of the shoulder below, to the edge of the withers above. Its outline is well marked and easily traced, when the horse is thrown into action. Its length bears an intimate relation to the length of the animal's stride, and consequently it can hardly be too long. The position of its upper extremity should be particularly observed. It ought to lie as close as possible to the ribs and spine. If it is so wide set as to permit a person's fingers to be thrust down between it and the withers, the action of the forequarters will be lubberly and unsafe.

The length and slope of the shoulder are to be estimated by the length and slanting position of the shoulder-blade, and not, as is very often the case, by the appearance of the shoulder-top. I have often been amused listening to the observations made by men, who pass for judges, upon a neat little horse which I drive in my gig at present (1851). The first point which attracts their attention is the shoulder. In their estimation it is absolutely perfect; and their astonishment is great when I tell them it is one of the worst features in his body. They are misled by the height of his

withers and the remarkable depth of his shoulders. He is so perfect in these two points, that they entirely overlook the position of his shoulder-blades. In place of being well slanted, the blades are nearly perpendicular; and this one defect has consigned to the collar an animal who, in many respects, would be particularly valuable for the saddle. So great is the effect of his upright shoulder-blades, that he is not safe even in harness.

There is a peculiarity in the attachment of the shoulder-blade to the body, which does not occur in any other part of the animal. All other bones are united together by the intervention of cartilages or joints; but in this case, the union with the body is effected solely by means of muscular substance. There is nothing approximating to a joint. The shoulder-blade is slung, as it were, in a mass of muscle. This arrangement serves completely to break the shock of the gallop or leap, and, at the same time, renders shoulder-lameness a very rare occurrence, except as the consequence of a direct local injury. If the smith and farrier were aware of this fact, they would not trace to the shoulder, as they do, one-half of the diseases which are located in the foot and leg. By referring the lameness to the shoulder, the smith can easily get rid of the results of bad shoeing.

The humerus, or lower bone of the shoulder, is strong and round in its shaft. It reaches from the lower end

of the scapula, at the point of the shoulder, to the top of the foreleg. It is by its means that the shoulder-blade is united to the bones of the leg. Some parties imagine it is an advantage to have this bone as short as possible, for the purpose of keeping the point of the shoulder light. But from this opinion I am disposed to dissent. I think lightness in the shoulder-points is quite compatible with a considerable elongation of the humerus. If this is the case, it is a matter of some importance, as an addition to the length of this bone would increase the length of the stride, and add to the elasticity of the fore-quarter. If the humerus were long, and placed in the horizontal position, the leg would undoubtedly be thrown a great deal too far back. There would then be too much weight at the point of the shoulder, which is an insuperable fault in a saddle-horse. This conformation, moreover, is not favourable even for the harness or draught-horse, because he will be obliged to elevate his shoulders considerably every time he puts forward his foot. He will have a sort of rocking action, which is rough and disagreeable, and unfavourable for draught. But the case is quite altered if the humerus is well slanted upwards and forwards, in the opposite direction to that taken by the shoulder-blade. This arrangement will permit it to be long, at the same time that sufficient lightness is preserved in front of the leg. Such a development is most important for every horse but the carter. He

will do very well with a short humerus moderately slanted. If his shoulder-points were very high, he could not easily throw his weight into the collar; and on the other hand, it is not by any means desirable that his leg should be thrown far back from his counter by a long, horizontal humerus. One of a moderate length, and a little sloped, will answer him best.

A long, well-slanted scapula, and a tolerably long, well-slanted humerus, must of necessity form a deep and elastic shoulder, whilst the leg will be favourably placed in reference to the weight it is destined to carry. Whatever opinion may be formed, however, as to the advantages of a long or a short humerus, all will agree on this point—it is necessary to have the points of the shoulder light, if we wish the horse to be kept without broken knees. The leg must not, under any circumstances, be placed at a great distance from the front of the counter; nor should it, on the other hand, be brought very far forward. A medium position is decidedly the best, as that will insure a favourable leverage with a moderate weight.

The muscles which move the shoulder should be large, long and powerful in every description of horse. To this there can be no exception. They should even be strong and thick on the withers, and on the top of the shoulder-blade, in the roadster, hunter, and racer. If there is plenty of substance in this locality, there will surely be a proportional strength in the shoulders, and con-

sequently a greater capacity for carrying heavy weights at long distances. Thin shoulders are generally admired, but I confess I cannot see any advantage connected with them. If they make the fore-quarters light, they will render them weak in the same proportion. It requires a great deal of power to raise the weight of the fore-quarters, in addition to the weight of the rider, in the act of galloping or leaping; and this power cannot exist without a corresponding amount of muscular development. It must therefore be plain, that a thick shoulder is decidedly preferable to a thin one.

Muscular shoulders must not, on any account, be confounded with wide-set, loose shoulder-blades. The one increases and strengthens action, the other destroys it. There cannot be too much muscle, provided the shoulder-blades are well slanted, and lie close to the ribs. This is a point of infinite importance, and should never be overlooked. It is from neglecting it that all the errors have arisen. A heavy, upright shoulder will suit well for the cart-horse; but the roadster, hunter and racer, must have their shoulders muscular, tight, and very far thrown back. This conformation will be sure to produce light and safe action, with immense power.

I prefer a thick to a thin shoulder only when the thickness arises from muscular development. If it be owing to any other cause, it will be an injury rather than an advantage. It must be particularly observed, that the

thickness is not caused by a projection of the shoulder-blade as far upwards as the top of the withers. This happens in some cases, and it is a most indubitable fault. In every case, the withers ought to be higher than the top of the scapula.

The shoulder-blade should terminate about the same point in all horses, although the height of the withers must vary in different cases. The difference in the height must depend altogether upon the length of those spinous projections which form the withers. The heavy draught-horse, as well as the racer, ought to have the withers considerably higher than the top of the scapula. The harness-horse, hunter and roadster, must have them far higher still. But whether they require to be long or short, they must be supplied with powerful muscles, and these muscles ought to fill up the space on each side of the spine so well that the tops of the shoulder-blades would appear to be lost in their substance. The shoulder, at this point, should be thick from muscular development, yet even and smooth.

THE FORE-LEG.

PERHAPS the majority of those who undertake to judge the horse will estimate the strength of his foreleg almost exclusively by the amount of substance which he possesses under the knee. This however is a mistake, as the part of primary importance is undoubt-

edly the arm. I have even heard some men say, that the defects of the fore arm could be compensated for by the state of the shoulders, and the thickness of the leg. In proof of the correctness of their opinion, they have cited the performance of Lord George Bentinck's Discord, whose shoulders and legs were remarkably strong, whilst his arms were wretchedly weak. Now, I readily admit that Discord was a strong-constitutioned, game, weight-carrying horse; still, I am quite certain that if, in addition to these valuable qualities, he had been supplied with plenty of muscle in his arms, and had possessed a favourable leverage in his hind and fore-legs, he would have been a first, in place of a third-class racer. He had so many good things about him, that after having looked him carefully over, I can see no way of accounting for the many defeats he sustained, except by referring them to the poverty and shortness of his arms, the great distance at which his hocks and knees stood from the ground, and the straightness and shortness of his thighs.

Those, however, who consider that the defects of the arm can be compensated for by the state of the shoulder and leg, must have a very imperfect idea of the nature and uses of the parts concerned. This is clearly demonstrated by the simple anatomical fact, that all the muscles which move the leg and foot are located on the arm. Now, as the muscles are the only moving power in the animal, and as all the muscles which are engaged

in extending and flexing the foot and knee, are situated on the arm, it must follow that the strength of the arm is a matter of primary importance. Let any person take the trouble of grasping his left arm below the elbow, with his right hand, whilst the left hand is opened and closed, and he will be fully satisfied that he grasps the muscles which flex and extend the fingers. This fact will at once show him it would be quite ridiculous to imagine that a strong shoulder and wrist could make amends for a defective development of these muscles, simply because they do not perform the same duty. So is it with the horse. It is absurd to lay such extraordinary stress on the thickness of the leg, whilst the condition of the arm is entirely overlooked. The one cannot do the duty of the other, and, consequently, they should both be as perfect as possible.

It has been well remarked by Mr. Youatt, that "whatever other good points the animal may possess, if the arm is narrow in front and near the shoulder, flat on the side, and altogether deficient in muscular appearance, that horse is radically defective. He can neither raise his knee for rapid action, nor throw his leg sufficiently forward."

The arm should be very broad at its junction with the body, for the purpose of affording an extensive basis for the attachment of muscles. The projection of bone called the elbow, which can easily be felt at the back part of the top of the arm, demands special

attention. The advantage, in muscular action, which is gained by the addition of an inch to its length, is prodigious, as could easily be proved by a reference to the principle of the lever in mechanics; and therefore it is a matter of great importance to have the elbow thrown far back from the front of the arm. The more breadth and strength there is in this locality the better.

There are three masses of muscle connected with the arm which should be carefully inspected. They are all capable of being seen and distinctly felt. Unless the inspection is made in a very slovenly manner, they cannot be confounded with each other, or with the bone. One of them is placed on the outer edge of the arm in front; the second is directly behind; and the third is inside, at the junction of the leg and chest. They must all be large and strong, no matter to what purpose the animal is to be applied. The first and second are engaged in extending and flexing the limb, and the third has the following very important office to fulfil: when the horse is trotting or galloping, it confines the arm to the side, keeps the leg in a straight line, and prevents the limbs from being too widely separated, and thus spread abroad by the heavy pressure of the weight above. Not one of these muscles can be dispensed with under any circumstances, as the strength of the fore-leg, and its power for carrying forward the machine, bear a direct proportion to their development. Weakness in them is unquestionably a radical defect. They have

a most onerous duty to perform, and no other muscles can fulfil it in their place. The first two must not only be strong, but it is also absolutely necessary that they be long. The longer the muscle, the greater will be the amount of its contraction, and the amount of the contraction determines the length of the stride. A long arm, furnished with long muscles, is a decided advantage to every horse intended for useful purposes; and, in particular, it is indispensable to the racer. If an animal, however, is doomed to carry a dandy, the arm requires to be short, in order to give a dancing, prancing, showy knee action, which will attract attention to the fancied importance of the empty-headed rider. It is in this case alone I would advocate a short arm; in all other instances it is decidedly the better of being long.

The knee should be flat and very broad. It is exposed to frequent and violent concussions, and therefore requires a great breadth of surface for the purpose of affording sufficient room for the insertion of such powerful tendons and ligaments as are required about a joint composed of eleven different bones. It is worthy of remark that, in nine cases out of ten, the seat of lameness in the fore-leg will be found somewhere between the knee and the ground, whereas in the hind-leg it is almost invariably in the hock.

The part included between the knee and the pastern is called the leg. It is composed entirely of bone,

skin, sinew, and ligament. There are no muscles attached to it, and, consequently, it acts merely as a lever for the support and propulsion of the machine. I have already alluded to the erroneous opinion which connects the idea of strength in the entire limb with the thickness of the bone under the knee. I might even go farther, and assert that a moderate-sized shank-bone is the best, provided its extremities are sufficiently expanded for the attachment of ligaments.

Large muscles and moderate-sized bones are a sure indication of an active temperament, and *vice versa*. The tissue of the small bone is dense and firm, whereas in the large one it is light and spongy. Does any person ever think of comparing the ideas which he entertains regarding the proper size and proportion of the leg in the man and the horse? Are large bones immediately above the ankle and wrist-joints ever taken as indications of the strength and mettle of the man? Certainly not. They are generally found largest in men of soft, flabby constitutions. Let any person take a look at the likeness of some of the pugilistic champions of England, and he will certainly admire the smallness of his bones, when compared with the enormous muscles of his legs and arms. Has it not always been thought a point of great beauty, that the bone above the ankle-joint should be small, and the ball of the leg large? And is not this conformation generally found in persons of tight, wiry, active, and indomita-

ble constitutions? What reason is there, then, for wishing to see a fine shank-bone in the man, and a thick one in the horse? On what principle could we argue for the difference? I confess I never could see the advantage of having the body of this bone large in the horse; and there are not many, I imagine, who would admire the human leg, with the thick end of it next the ground.

I must, however, guard against being misunderstood upon this point. I will always protest against having the body of the shank-bone too thick; but I must, nevertheless, have a broad leg and a large joint. The shaft of the bone ought to be flat and compact; but its ends require to be greatly expanded, for the purpose of affording plenty of space for the attachment of those ligaments which secure the joint, as well as to give an advantageous position to the sinews which terminate about, or run over it.

Speaking of the shank, Nimrod says, "I require a large grasp of flat, ropey sinews, not caring so much about the main size of the bone as the material of the adjoining parts."—*Sporting Magazine*, New Series, vol. xxiii. p. 129. With this opinion I entirely coincide. The leg should be thin, when viewed in front, as that will show fineness and flatness of bone; but its side must be broad, otherwise the sinews which belong to the muscles of the arm would act at a great disadvantage. These sinews ought to be thrown far

back from the bone, in order to increase their leverage power. They should also be thick, as large sinews are always connected with large muscles. They should be capable of being felt as so many distinct and separate cords, running from the muscles of the arm to the fetlock. If they are surrounded with soft, elastic, puffy material, they will not stand much work. The hard, thick, wiry, and distinct sinews are the right sort for tear and wear.

The soft, gummy, round condition of the legs, may be owing to an original defect in the constitution, or it may be caused by a temporary state of ill health. In the first case it will scarcely admit of a remedy, and it is a very bad sign of the lasting qualities of the animal. All the joints will be liable to disease, and the sinews are not to be depended on for fast and severe work. In the second case, however, there is more hope. If we can arrive at the cause of the deviation from health, there is every prospect of a satisfactory result from a rational treatment. But as this point falls more immediately under the cognizance of the veterinary practitioner, it would be foreign to my purpose to enter upon its various details. Still there is one view of it which is often overlooked, and which is so very important, that I must place it before my readers, by quoting the following most excellent remarks from Harry Hieover's treatise on "Condition"—"Swelled legs," says he, "are much oftener attributed to

overfulness of habit than, I think, experience warrants; I have more usually found this predisposition to arise from weakness. It may be said, and it is sometimes found to be so, that the legs would not swell so much with the horse at grass as in the stable; it is therefore inferred that the stable-feeding causes the defect, in nine cases in ten. This is an error. The legs do not swell, perhaps, in some cases, so much at grass as in the stable. This arises from the constant exercise the horse takes while at liberty; but bring him into the stable, and his legs will be found to swell far more after his grass-feeding than before. I have not had many horses subject to swelling of the legs, but such as I have had, I always found benefited or cured by the very reverse of grass—namely, beans in addition to their oats, and tonics as medicine. Diuretics, that grooms are so fond of, will be found, in most cases, to aggravate the ailment. If the swelling is accompanied with great heat and tension of parts, and more particularly by cracked heels, then mild aperients and fomentation is a good beginning; but where any flaccidity exists, stimulants and tonics I have found the sovereign remedy." These remarks correspond most completely with my own practical observations, and they are in perfect accordance with sound views of animal physiology.

The farther the sinews are thrown out from the shaft of the shank-bone, the better. If they are tied

down to it, they will produce such an injurious strain upon the ligaments which bind them in their place, that the horse will readily break down in his work. When both extremities of the shank-bone are well-developed, and the tendons run in a straight line from end to end, there will be so much room for the insertion of ligaments, and the leverage will be so favourable for the tendons, that the legs will stand an enormous amount of work. This is the best formation that could be wished.

I think it is just as necessary to attend to the condition of the parts next the pastern, as to that of the spot under the knee, which has always commanded special notice. They are both very important. It is frequently owing to a small, confined, contracted development at these localities, that horses give way in their fore-legs.

There is an arch or bridge directly behind the knee, through which some of the sinews belonging to the muscles of the arm pass. If it is not placed at a proper distance behind the end of the shank-bone, these sinews must be tied in, by the transverse ligaments, at the point where they emerge below the joint. This is certainly a great defect, as the ligaments will be subjected to a greater strain than they are able to bear. In judging of the state of matters here, however, we must be careful to avoid mistakes. The arch, which is composed of ligaments and a bone called the tra-

pezium, requires to be thick and strong, and therefore it must extend to some distance *beyond* the sinews which are to pass *under* it. Besides the trapezium ought to be very large and well thrown back, for the purpose of affording a favourable leverage, as well as a large basis of attachment, for those muscles of the arm which are connected with, and terminate in, it. Hence it follows that we must expect a slight dip rather than a perfectly straight surface, immediately below the trapezium. The centre of the lower extremity of those muscles which lie on the back of the arm, may be taken as the point from whence the sinews start. The sinews should be permitted to run in a perfectly straight line from their commencement here, until they pass over the lower end of the shank-bone towards the back of the pasterns. The less they deviate from this line, the more perfect will be their action, the less strain will there be upon the ligaments, and the greater will be the amount of exertion which the parts will endure with impunity.

I need scarcely remark here, that the leg-bone of the cart-horse must be a great deal thicker than the same part in the thorough-bred, in consequence of the great difference which exists in the density of their structure, as well as to preserve a due proportion in the general outline of the animal. We should never judge of the thickness of the legs in a blood-horse by the look of the eye alone. They are always deceptive,

and will measure far more than they look. But it is very different with the low-bred horse. In his case the legs, and the body too, will always measure less than a person would be led to expect by their appearance.

In the racer, the leg must always be short, and the arm long. Indeed this rule holds good in reference to all animals in whom speed and durability require to be united; and, for my part, I think this is by far the most advantageous arrangement for every description of horse.

A good judge will invariably look to the length, strength, and slanting direction of the pasterns. Bad pasterns constitute an unpardonable defect. They should be very strong in every sort of horse; but their length and position must vary considerably in different cases. In the carter, they should be short and slightly laid back. The hackney requires an increase of length, with a much more slanting position. The hunter need not differ much from the hackney; but the racer must have very long, well-slanted, and elastic, though not weak or sinking, pasterns, to give him elasticity of action, and extent of stride. "Experience among horses," says Mr. Youatt, "will alone point out the most advantageous direction of the pastern for the purpose required; but the slightest observation will show the necessity of considerable variety in the structure of this part. Let the reader imagine the heavy dray-

horse, with his short and upright pasterns, contending in the race, or the race-horse, with his long and weak pasterns, endeavouring to dig his toe into the ground, in order to move some heavy weight. The concussion which attends the common action of the cart-horse is little, because his movements are slow; and therefore the upright and strong pastern is given to him, which he can force into the ground, and on which he can throw the whole of his immense weight. The oblique pastern is given to the race-horse, because that alone is compatible with extent of stride, and great speed."

A saddle-horse, with short, upright pasterns, will invariably feel stilty and uncomfortable under his rider; whilst the constant unbroken jars to which, in such circumstances, he is subjected, will be quite certain of inducing disease in the feet and legs. In fact, pasterns of this description are altogether unsuitable for any horse intended for fast work, either in saddle or harness. Length alone, however, will not do; it is indispensable, also, that they be oblique. Let their length be what it may, when they are upright they will want elasticity; and a horse, in fast work, might just as well go on a pair of stilts as on them. The hackney, the hunter, the steeple-chaser, the flat-racer, and the harness-horse, all require long, well-slanted pasterns; but they must not, under any circumstances, have them small, weak, and sinking. Of all these, the flat-racer requires the longest. If the pasterns are too long and too

small in the hunter and steeple-chaser, they will not be able to sustain their weight in dropping from their fences. But if they are tolerably long, very thick, and well-slanted, they will have plenty of strength, combined with a sufficient degree of elasticity. An upright pastern, whether long or short, is highly objectionable in a horse for either saddle or harness, and a weak one is, in all cases, unpardonable.

THE FORE-FEET.

THE foot has, with great propriety, been considered a very important portion of the horse. It matters not what else may be good, if the feet are bad the horse will be greatly deteriorated in value. The pace must tell on them, as "it is the pace that kills." They will be sure to get done-up on the road, or perhaps even in the hunting-field. Of what use are good legs and a well-built carcase, when the animal is crippled in his feet? A man might become a useful member of society, through the instrumentality of his brain, even although he used an artificial foot; but a horse is good for nothing, if his feet are so badly formed as to be unfit for carrying him through his work. A wooden-leg would not answer here. He would not even do to breed from, as his own natural defect, in all probability, would appear in his offspring.

By what means are we to form an accurate estimate of the qualities and condition of the feet? Simply by inspection. If the examination is made with care, we will seldom be mistaken.

The feet should always bear a neat proportion to the size and weight of the animal they are destined to carry. It is just as bad to be too large as too small. A very large foot, such as we frequently see in the draught-horse, is particularly liable to descent of the sole, which is a most serious affair; and a very small one, such as we often find in the blood-horse, is predisposed to contraction, which is by no means desirable. Here, as in many other cases, the medium size is the best.

I do not pretend to be able to settle the point as to whether or not contraction *alone* may *ever* be able to produce inflammation and lameness in the foot. To do this would require a great deal more knowledge than I possess. Moreover, I do not think it is capable of being satisfactorily settled by any other person. To those who are conversant with the nature of the parts concerned, it must appear very difficult, if not impossible, to determine, with perfect accuracy in every case, the exact point at which disease may commence. No doubt, in most instances, contraction is the *result* of internal inflammation; but I think it is going too far to assert, that it never can become the *cause* of the internal disease.

It appears to me that writers are not sufficiently precise in the use of the term, contraction. They appear to apply it indiscriminately to a natural development and a diseased condition of the heel. This I think is not right. The one might be called a narrow, and the other a contracted, heel. At all events, the same term should not be used in both cases—more especially as there is seldom any difficulty in distinguishing between a foot which is narrow by nature, and one which is contracted by disease.

"I have yet," says Nimrod, "to see an instance of contraction alone producing lameness in the foot of a horse. On the contrary, my experience has justified the conclusion, that the narrow, mule-like foot is the foot most likely to stand, uninjured, very severe work on the road. Asses, mules, and ponies bear me out here; for they are never lame in their feet, though they are contraction exemplified. I am convinced that contraction of the hoof, when not natural, is the *effect* of internal inflammation of it; but I have never seen a solitary instance of its being the *cause* of lameness." Now, with all due deference to this celebrated writer, I must take exception to this statement. The foot he refers to must be a natural, sound, and healthy one, which consequently has no right to be lame, and although narrow, it should never be called contracted; or else we are driven to the ridiculous necessity of believing that a *diseased* foot is more "likely to stand,

uninjured, very severe work on the road," than a *healthy* one.

The foot which is *by nature* mule-shaped is not diseased, and therefore is not lame. We may call it a narrow foot, but we have no right to call it a contracted one. It would just be as reasonable to apply the same term to a narrow counter, or a thin shoulder. The word, contracted, should be used only when the parts are diseased. The internal and external parts of a natural, mule-shaped foot are all made on the same scale, and consequently bear such a proportion to each other, that they work in perfect harmony. Not so, however, with the real contracted, or diseased, foot. In its case, the walls of the hoof, from some cause, approximate more closely to each other than they did in their healthy condition, and thus come to press injuriously upon the parts contained within their cavity. Tenderness and pain are the inevitable result. If all the internal parts would change their form and size at the same time that the hoof was undergoing its change, of course actual lameness would not follow; but this unfortunately does not take place.

The majority of people are fond of a very large foot, but I am certain this is a great mistake. Leaving the diseases to which it is exposed out of the question, I look upon it as an indication that all the bones of the animal are soft and porous. A moderate-sized, neatly-proportioned foot, is just as good a sign in the

horse as in the man. If we were choosing a man for walking, running, leaping, or wrestling, we would never think of selecting a fellow with clock-killing platters of feet. He would no sooner make his appearance than he would be rejected as totally unfit for the work. Why then should we prefer a similar development in the horse? Does he not require a tear-and-wear sort of foot as much as the man? He surely does; and one, too, that he can lift and lay in a lighter manner than if it were a fifty-six pound weight he had attached to his leg. The horse is not intended for passing over a moving-sand or a quagmire, and therefore he does not require an enormous foot. In this instance, as in many others, the medium size is far the best. In fact, it is the only safe one. A foot which is either very large or very small, is liable to a variety of diseases, which will be sure to impair its usefulness. The one extreme is nearly as bad as the other. The bones of the foot should bear a reasonable proportion in size to the bones of the leg; and the hoof should be just so large and so strong, as to afford perfect accommodation and protection to all the bones, ligaments, vessels, and nerves which are contained within its walls. Any deviation from these proportions must be looked upon as a radical defect.

The shape of the foot is of quite as much importance as its size. The hoof should be rather longer than broad on its ground surface; and its breadth should

die away very gradually and slowly towards the heel and toe, so as to leave the greatest breadth across the centre. It should be tolerably deep from the hair to the point of the toe, and then lessen gradually in height towards the heel, still, however, preserving a fair amount of thickness. Avoid a very high heel quite as much as a very low one. Both are decidedly objectionable.

I cannot agree with the generally received opinion, that the circular foot is the best and most naturally formed. I am quite satisfied a perfectly round foot will not stand anything like the same amount of work as one that is a little longer than broad. The difference, however, in length and breadth, should not be extreme. Moreover, there is a great probability that the elongated foot is the most natural for the full-grown horse. I may be told the foal and the unshod horse have both round feet, and therefore that the round form must be the natural one. But I am not satisfied with the correctness of this line of argument. It is quite as unreasonable to argue that the foal's foot should still preserve its shape, as it would be to affirm, that its legs and head must always continue to bear the same proportion to the rest of the body, as they did at the time of birth. In short, the foal becomes greatly changed as it passes into the horse, and I do not see any reason why we should expect the feet alone to remain stationary in their form.

If the horse were allowed to arrive at maturity before being shod, the shape of his foot would probably, to a certain extent, depend upon the way in which he was reared. If he were kept constantly roaming over damp, marshy land, the moisture would encourage the spreading, or circular form. This would be well suited for the circumstances in which he was placed; and nature would be sure to accommodate itself accordingly. A broad, round, soft foot is all that a horse in such a place could require. The case is entirely altered, however, with the horse which has been reared on an arid soil. There is so little moisture in the ground, that the foot has no tendency to spread, or get soft. It will be hard, firm, and more or less elongated. This is the right tear-and-wear sort of foot for road-work. The dryness of the road will not do it much injury, because it has never been accustomed to an excess of moisture.

See that the external surface of the hoof is smooth all over, as depressions and elevations lead to the supposition that the walls have sunk in consequence of internal disease. For the same reason, ring-like protuberances must be looked upon with a certain degree of suspicion. The crust must be smooth and tough-looking. A brittle hoof is a great drawback, as it will be very likely to get split by the nails; and the slightest strain upon the shoe will not only leave the horse barefooted for the time being, but also deprive him of

portions of the crust. This is very annoying, and if it is allowed to be repeated from time to time, there will be great difficulty in attaching the shoe to the foot at all. Such a state of matters can be obviated only by due care in the stopping and dressing of the feet with appropriate applications.

The thickness of the crust can easily be ascertained by paring the sole. A thin crust is an irremediable defect. It is not strong enough to protect and support the parts within, and it is extremely difficult to shoe the foot without causing lameness, by running the nails too close to the quick. There is every probability of the horse being tender-footed.

The crust is covered by a thin outer coating or layer, which should never be rasped off by the smith. The removal of it is injurious to the foot, and ought to be guarded against. It is generally difficult, however, to prevent the smith from rasping it off, as he imagines such an operation gives a tidy-looking finish to his work.

The slant of the hoof requires particular attention. It is said that it should form an angle of about forty-five degrees. If the hoof is more upright than this, and is very deep at the heel, inflammation and contraction will be liable to ensue; but if it is very much the reverse, flatness of sole, and weakness of the internal parts are indicated. A little practical observation will enable a person to judge of the proper slant and direction of the foot and pastern. If the feet and

pasterns are well formed and favourably united, they will stand an immense deal of work without the supervention of ring-bones, or any other disease. When the heel is very low and the foot thin, the bones of the pastern will observe such a direction as to produce a sinking at the coronet, and probably a knuckling forward at the lower end of the ~~shank~~ cannon besides. This will cause a stress on the sinews and ligaments, and the formation altogether is a very bad one. On the other hand, when the heel is too high, there will be a want of proper elasticity in the pastern, and the parts are predisposed to disease.

The ground-surface of the foot is deserving of consideration. It should not be either very flat or very hollow. A flat sole can hardly be prevented from descending so far as to cause lameness, by pressure against the shoe, whilst an extremely hollow one is indicative of contraction, present or future. Here, again, the medium state is the best.

The frog must be large, elastic, and healthy-looking. It should be kept particularly free from thrushes. The inflammation and discharge connected with them are sure, if allowed to continue, to end in most serious, and perhaps irremediable, injury to the delicate parts within. They will cause lameness for the time being, and ultimately contraction of the heel. A great deal of the soundness of the foot depends upon the condition of the frog. If it is allowed to get too dry and

shrivelled, from the want of occasional stopping while the horse is standing in the stable, there will be a general hardening of the foot, which is by no means conducive to its health; but if from being constantly exposed to moisture, either on damp pasture-land or in a filthy stable, it is kept too soft, it will be affected by thrushes, which, from their nature, must interfere with the proper growth and nourishment of the foot. The owner of the horse should take no excuse for the existence of thrushes, as they always supervene upon negligence and bad management.

The frog should be neatly dressed, but not much pared away, during the operation of shoeing. It is probably intended by nature as an elastic cushion to break the force of the shock which otherwise would come on the sensible parts above it during the various movements of the animal. Still I think the full extent of its office is not very clearly understood. There is a general opinion amongst the old Veterinarians, that it materially assists in expanding the foot; but I am sure they are astray on this point. The opinion, perhaps, originated from the wedge-shaped appearance of the frog. White says, "It resembles a wedge; but towards the heel, where it becomes wide and expanded, there is a separation in the middle, which is continued to the heel. When the frog receives the pressure of the horse's weight, this separation is increased, and consequently becomes wider; and, as it is connected

with the heels of the crust, the same effect must be produced upon them." This theory is very beautiful; but I believe, with Nimrod, that a bit of spongy substance, such as the elastic frog of a horse, has very little chance of resisting the united pressure of iron and horn. In short, it is not to be supposed that an elastic substance, which must yield to pressure, could act as a wedge, in expanding hard and solid materials like the bars and crust of a horse's hoof. Whatever may be the use of the frog, I am certain this is not it. No man would attempt to split a block of wood by a wedge of india-rubber. Why, then, are we to suppose that the elastic frog acts as a wedge? I cannot pretend to determine all its functions, but I believe it has a great deal to do in keeping the delicate parts which are placed above it in a healthy, natural condition.

The bars, which are situated on each side of the frog, are ~~evidently~~ composed of the same kind of material as the hoof. They require to be very strong and hard. Their structure and position render them eminently fitted for preserving the shape of the heel. Indeed, if it were not for them, the quarters would certainly fall in towards each other, and the horse would get lame. The slightest inspection of the foot is sufficient to convince any person of this fact. It therefore behoves every individual who cares for the preservation of his horse's foot, to take care that the bars are never thinned and weakened, either on the side next the frog

or the crust, by the smith's paring-knife. The rage which exists for opening the heel, as it is called, is most absurd and injurious. Smiths have been so much in the habit of doing this, in order to satisfy the ignorance of their customers, that it is now like a second nature to them, and it is frequently very difficult to persuade them to spare the use of the steel. If anything is sliced off the back of the heel, at the point where the hoof turns in to form the bars, it must weaken the arch most materially; and thus, by allowing the crust to approach the bars or the frog, contraction will be encouraged, and in all probability corns will be produced.

It appears to me very inconsistent in the old veterinary writers to insist so much as they do upon keeping the bars in their full thickness and strength, whilst they hold the opinion that the heels, which are formed by the union of the bars and crust, expand as soon as the weight of the animal is thrown on the foot. Surely, if there is any expansion here, the thinner the bars are the better, as they could then expand the more freely and readily. But the fact is, to those who are not over-much given to theorising, it will at once appear evident, after a careful inspection of the prepared foot, that no such expansion takes place—that the bars, like the diagonal rails on an iron gate, are purposely intended to prevent either expansion or contraction; and therefore the stronger they are, the

more effectually will they perform their duty in keeping the walls of the foot perfectly immoveable. The writers referred to are quite right in insisting, at the hands of the blacksmith, upon the preservation of the bars; but their directions on this head are inconsistent with their own ideas about expansion. The antiquated notions about expansion of the heels and descent of the sole are almost completely exploded, as the Veterinarians of the present day are making rapid strides towards the adoption of all rational views on this as well as other subjects.

The sole is that part which intervenes between the crust, the bars, and the frog. In a well-formed foot, it is always a little concave. As I do not believe in the current opinion about the descent of the sole under the weight of the horse, any more than I do in the expansion of the heels, I would not, of course, be disposed to allow the sole to be pared very thin at the time of shoeing. So far from that, I think a thin sole is a most serious defect. It will render the horse very tender, in passing over broken stones—so much so, that he will probably come off with a pair of broken knees. The sole should be pared a little lower than the crust, but it certainly should not be made very thin. If it is ever thought necessary, in the treatment of corns, to lower it in the angle between the bars and the crust, the operation ought to be done carefully with a small instrument, so that neither the crust nor the bars may

be in the slightest degree weakened. If they are weakened, the pressure on the corns will become the greater, and the disease, in place of being cured, will be increased.

GROWTH OF THE FEET.

If young horses were to receive the attention they deserve from the time of their weaning, they would have much better shaped and sounder feet than they have under the present system of management. In place of expecting a large number of well-formed feet, we should rather be surprised to see one at all, when we reflect upon the manner in which the poor animals are generally reared. Young horses are often kept standing in moisture and filth, till their feet are ruined by the ravages of thrushes, and their hoofs are seldom dressed before they have grown to such an extent, that the unfortunate creatures are obliged to walk almost on the back of the pasterns. If the stall were daily swept and littered, it would tend very much to the health of the foot, as well as to the comfort of the animal. The feet should not be kept either too moist or too dry, as either extreme is injurious. They should be dressed regularly every fourth week, in the same way as if they were to be shod. If this is done with judgment and discretion, they will be brought into the most suitable form, and the animal will turn out much more valuable

than if it had been neglected or injudiciously dealt with.

SHOEING.

It would be foreign to my present purpose to enter at any length on the question of shoeing, but I think it advisable to make a few observations on one or two points.

The operation of shoeing should be performed every third or fourth week, according as the hoof may be active in its growth, or otherwise. If the growth of horn is extremely rapid, the heels will require to be lowered, and the toes shortened, at the end of three weeks; but if it is slow, the shoes should not be changed before the end of the fourth week. Unless there is some very special reason for it, however, they must never be permitted to remain on longer than this. I am quite certain many horses have the shape of their feet completely spoiled by wearing their shoes beyond the proper period for removing them. This they are allowed to do by way of economy, but it is an ill-timed attempt at saving.

I have a great objection to what is called removing the shoes. It is far better to have a new set than to re-apply the old ones. It is impossible to re-adjust the old shoes to the feet with sufficient accuracy, without taking nearly as much trouble as would suffice for the making of a new set. Hence it will be found that

horses never travel comfortably with them on. They are not properly adapted to the feet, and consequently the animal must suffer more or less pain from their application.

When a horse is judiciously and suitably shod, he will go with ease and comfort immediately after he has come from the forge. It is only an excuse for bad workmanship to say, he will improve in his action after his shoes are worn awhile. Instead of requiring time to bring the hoof to the shape of the shoe, the shoe should have been accurately adapted to the shape of the foot at the first.

As it is not always possible to obtain the services of a first-rate smith, it is a good plan to have a horse shod at least a fortnight before he is exposed for sale, or is submitted to the inspection of a Veterinary Surgeon. I have often seen horses with perfectly sound feet showing lameness, or short action, at the very critical moment, in consequence of some blunder in the application of their shoes, which were put on the day before. The operation is deferred to the last hour, in order that the feet may look neat and tidy at the time of sale. But an ill-fitting shoe, a tight clench, or a nail too close on the quick, will frequently cause the seller to wear his countenance rather long. This could never have happened if the shoes had been worn ten days or a fortnight, because there would then have been plenty of time to discover and rectify mistakes.

The old shoes should be removed from the feet with great care, after all the clenches have been cut. If they are dragged off in an awkward and careless manner, without cutting the clenches, the sole may be bruised and injured, or the edges of the crust may be cleft and broken. This part of the operation is seldom done with the neatness and care which it requires.

There are some important points in reference to the paring of the foot, and its preparation for the shoe. The ground-surface of the crust should be made perfectly level all round, and its outer, thin, edge should then be nicely rounded off, as recommended by Colonel Fitzwygram, with the rasp, placed in such an angle as to take off the feather-edge without touching the sole or the outside of the hoof. To be properly performed, this must be done before, and not after, the shoe is attached to the foot. The sole ought to be kept a little lower than the edge of the crust, so as to prevent it from pressing on the shoe, but it must not be very much thinned. Some Veterinary writers lay so much stress on the descent of the sole, that they are very urgent in directing it to be closely pared, for the purpose of making it more elastic. I am quite confident they are entirely astray on this point. There can be no greater drawback than a thin sole. It should always be left as thick and strong as circumstances will permit. It will then answer its intended purpose of protecting the internal parts of the foot from injurious local pres-

sure. When it is thin by nature, or is made so by the knife, the horse will go very tender on broken stones, and will probably drop suddenly, in consequence of the pain he feels in the foot. The sole should be left as thick as is consistent with saving it from pressing against the shoe.

It is not generally necessary to take much off the frog. It should not be pared very close, nor yet left too large. Either extreme is objectionable.

When the toes are disposed to grow long, and the heels deep, they ought both to be well pared. If this is attended to, the foot will preserve its proportions remarkably well. Besides, a very long toe is uncomfortable and unsafe. Walking over it will fatigue the horse; and if the toe is not lifted high, the animal will be likely to strike it against the stones on the road. The heel should be lowered to a reasonable extent, but the paring must be confined entirely to the ground-surface. The crust at the back of the heel, and at the edges of the frog, should not be touched with the knife. "Opening the heel," as it is called, is most pernicious. The part of the crust which turns round towards the bars, and the bars themselves, should not on any account be weakened. These parts are intended to be firm, solid, and unyielding, and therefore they ought to be kept as strong as possible. As corns are produced by the pressure of the shoe on the sole, the smith must be careful not to weaken the bars or the

crust at the spot where they occur. If the crust and bars are in the slightest degree weakened, they will yield under the weight of the horse, and thus press so injuriously on the intervening sole that corns are nearly certain to result. Mr. J. Gamgee, who is a high authority on these matters, objects in the strongest terms to paring the sole in the angle between the bars and crust. I therefore at once yield to his good practical judgment, and expunge the sentence, on this head, which I published in the first edition.

After the operation of paring has been completed, the shoe ought to be carefully adapted to the foot. This cannot be done without a great deal of time and trouble. Hence it is seldom properly done at all. If the shoe does not sit perfectly level all round, and if it extends so far outside the hoof that the nails are prevented from entering the crust in the exact spot, and in the very direction, which they should, there will be a constant straining on the nails, which is injurious to the foot, and will be liable to chip pieces off the hoof. The shoe ought to be made wide across the foot, at the point where the two front nails are situated. The greatest mistake, I think, frequently lies here. In place of turning the shoe, at the toe, very carefully on the horn of the anvil, the smith generally sets it up on its side, and then strikes it with his hammer. The consequence is, it yields at the centre of the arch, and, instead of being nicely and regularly rounded in front, whilst the breadth

from side to side is preserved, the nail-holes on each side are brought nearer to the centre of the shoe than they ought to be. As a necessary result, the shoe, at the front nail-holes, is too narrow for the hoof, and, when it is nailed on, the crust presses injuriously on the internal sensible parts of the foot.

It is difficult to convince smiths of the possibility of laming a horse, by having the shoe too narrow in front. They generally think the whole difficulty lies about the heel. I once had a horse with small feet. He usually went very tender. When I complained to the smith that the shoes were not sufficiently wide across the front nails, and that they were driven and clenched a great deal too tight on the foot, he merely laughed at the matter as being visionary. He would not be persuaded that this was the cause of lameness. He always insisted that the legs must be at fault. From this opinion I begged to dissent. I thought the complaint must be in the feet, as there was no possible trace of disease in the legs. The smith's opinion, however, could not be changed, and, right or wrong, he followed his own plan of shoeing. The horse at length became so useless, that I was going to sell him for whatever he would bring. About this period, I fortunately had a conversation with a smith who entirely coincided in my own views. He asked me to give him one trial with the horse. I did so, and accompanied him to the forge. I saw the operation of shoeing performed, and ap-

proved of it highly in theory. In order to put the matter fairly to the practical test, however, I got the horse into harness directly after he was shod, and drove him out a few miles. His action was so very perceptibly altered for the better, that I determined not to part with him. My after-experience with him proved the correctness of my views.

With the exception of the hunter, nearly all horses should have the heels of the fore-feet shoes extended well back. Theoretically, this may not be thought necessary; but practically, it will be found most important. I am quite confident long shoes are highly advantageous.

Some parties are very fond of having the shoes to stand wide at the heels. I cannot see any advantage in projecting them much beyond the crust, *provided the turning-in commences behind the last nail-hole.* It is extremely difficult, however, to get this properly done, as the workmen generally, during the operation of turning the heels, bring the sides of the shoe closer together, and thus run the hazard of squeezing the sensible parts of the foot, by having the shoe too narrow at the seat of the last nails.

Since my manuscript was placed in the hands of the printer, I have taken an opportunity of looking into Stonehenge's *British Rural Sports.* I have not yet had time to read much of the book; but so far as I have gone, it is just such a work as I would expect

from the author of that valuable production, *The Greyhound*. In his observations on contraction in the foot of the horse, Stonehenge puts forward a new idea, which appears to me both rational and important. "In many cases," says he, "contraction comes on from improper shoeing, but not quite in the way that is commonly supposed. It is said by most of those who attribute its occurrence to bad shoeing, that when the shoe is allowed to remain on for more than three weeks, the foot is bound within certain limits, and cannot possibly expand, and therefore becomes contracted. But it is forgotten that in hundreds of cases, with every care, and with constant removals, the feet gradually assume the contracted condition. I am satisfied that the cause is a very simple one. In ninety-nine cases out of a hundred the shoe is made with the seating, or bevelled surface, carried out to the heel, or very nearly so, instead of leaving fully half-an-inch of the web perfectly level for the heel of the foot to rest upon. Besides this defect, most smiths make the shoe wider than the foot, whereby the heel is placed still more upon this bevelled edge than it otherwise would be; and the consequence is, that the horse is constantly standing and working upon a bevelled surface instead of on a flat one, and that surface has a tendency to drive the heels in. It takes some months, it is true, to produce the alteration; but nevertheless, though slow, it is sure, and if continued the horse is

almost to a certainty made a cripple by the long-continued use of such a shoe. Corns are also constantly produced by them. The remedy for contracted heels is, to place the foot upon a flat web, or sometimes even upon one bevelled at the heel in the opposite direction to the seated shoe. With this I have succeeded in two or three cases in rectifying contraction to a degree which exceeded my most sanguine anticipations."

The advantage or disadvantage of having calkins either on the fore or hind-shoes, or on both, will vary in different cases. But there should be no difference, under any pretence whatever, between the outer and inner heel of the same shoe, in point of elevation. A difference is frequently made for the purpose of preventing brushing, or, probably, for some imaginary reason; but it is highly improper, because in the long run it will be sure to induce lameness in the leg, in consequence of the weight of the body being thrown more on the one side of the joint than on the other. It is just as barbarous and injudicious to shoe a horse on this plan, as it would be to oblige a man to walk in a boot with one side of the heel double the thickness of the other. If the smith was obliged to walk for a month in a boot of this description, he would learn to act with wisdom and compassion towards the poor horse.

In putting on the shoe, the nails should be driven with a gentle hand, and they ought not by any means

to be clenched very tight. Hard driving and tight clenching will bend the hoof, at the place where the clenches are turned, inwards and downwards towards the shoe in such a manner as to injure the tender parts contained within the cavity of the foot. Besides, it is not necessary for a man to forget he is working with the foot of a living animal. The shoe will remain on a sufficient length of time with gentle driving and clenching, provided it is properly fitted to the foot. If it has a thoroughly even bearing, there will be little stress on the nails. The nails are often made so coarse that they split the hoof, and thus keep it constantly broken. A fine nail will answer all the purposes required, if it is made of the right sort of material.

I know of no worse fashion, in connexion with the application of the shoe, than the one which the smith has, of hammering the shoe on the one side or the other, after three or four nails have been driven, for the purpose of putting it straight on the foot. This is a speedy method of making up for his total want of accuracy in placing it at first; but it should never be suffered to be practised. It strains all the nails which have already been driven, and is thus calculated to do serious damage to the foot.

As I do not intend to give full instructions about shoeing, I will not pursue the subject any farther at present. It would require a special volume for its due consideration. I must say it was to me a mat-

ter of surprise that the celebrated "Nimrod" thought it of comparatively little importance how the horse was shod. He attributed nearly everything to the effects of pace. No doubt, pace must always tell; but there is just as little doubt that the pace would not be half so injurious as it is, if the horse were always as well shod as he ought to be.

Shoeing has been regarded by some as a necessary evil; still I am certain it is an evil in the horse or in the man only when it is improperly performed. I am confident in both cases it would be advantageous, rather than the reverse, if the artisan could always be made sufficiently acquainted with the theory of his profession, and had hands, or rather a head, for its due performance.

THE FORE-LEGS.

HAVING remarked thus much on the different parts of the fore-legs, it now remains for me to say a few words on their position, as a whole.

When viewed in front, the distance between the fore-legs ought to be, as near as possible, the same from the chest to the ground. This is the form which is most consistent with neat, straight, and speedy action.

On taking a side view, we should observe the perpendicular direction of the leg. When it is directed

backwards below, there will be too much weight in front of it, and the horse will be liable to fall. If, on the contrary, the foot is pointed far forwards, too much stress will be thrown on the back-sinews, and the action of the animal will be materially impeded; besides, this state of matters is sometimes indicative of disease in the feet. The leg should drop perfectly straight from its junction with the shoulder to the ground; and the point of the toe should come as near as possible to a straight line under the point of the shoulder.

The elbow can easily be felt at the upper and back part of the arm. Its direction must be attentively examined, as it is an important point. It should neither be out nor in. When turned in towards the ribs, it will rub against the girths of the saddle or harness, and thus become the seat of a troublesome and annoying sore. The inward direction of the elbow is also accompanied by an awkward knee-action, and the toe is invariably turned out. It is a very common thing for horses with this formation to strike the toe against the opposite pastern. They are then called brushers. If they should happen to go free from brushing, however, they are generally very safe to ride or drive. When the elbow is turned out, the toe is turned in, which is a very great fault — decidedly much greater than the reverse — as the horse is not usually safe to ride, nor is he possessed of speed. I once had the fastest trotting horse I ever saw; he was also remark-

ably safe and secure to ride, although his toes were turned in. But in his case the elbows were perfectly straight, and the turning-in at the toe was owing entirely to the peculiar setting-on of the foot, which made all the difference. I do not recollect of any instance of a fast and safe horse with his elbows turned out.

The knees should never be laid back, although many people seem to be of a contrary opinion. They imagine their backward position is a point of great perfection. They will frequently tell you such a horse cannot go down, because he is so well back on the knees. In this they are certainly mistaken. By this formation, the back muscles and sinews of the leg are all interfered with, and materially curtailed in their action. Besides, the position of the knee has very little to do in preventing a horse from falling. If it were otherwise, what on earth would become of the horses which have their knees bent completely forwards like a bow? If the opposite shape were necessary to stability, horses of this description need not take the trouble of rising, as they would be no sooner up than down again. Still further, is it not a very singular thing that these doomed animals are seldom seen with a broken knee? The leg, on a side view, should be quite straight from the shoulder to the pastern. But if in any instance the knee is to diverge from the straight line, let it always be forwards—never backwards. Some of the fastest, safest, and best horses that ever appeared on

the turf, the field, or the road, were forward on the knees; but I never knew of a right good one whose knees observed a decidedly backward position.

I think any person who takes the trouble of opening his eyes may see that the safety of the horse's knees depends chiefly *on the slant of the shoulder and pastern, together with the method in which the foot is brought into contact with the ground.* On this last point I am at variance with popular opinion, which says, that a horse, in order to be safe, requires to be a high lifter. I look upon high lifting as a very great fault. Just imagine a man walking down one of the thoroughfares of London or Dublin, and lifting his feet at every step half way to his knee! He would certainly gain a great deal of admiration, at the expense of his corns, and, perhaps, the point of his nose. Now, where is the difference between a man and a horse, which should make such a difference in the mode of their progression? It is the laying down of the foot which renders the animal safe. Of course, the foot should be raised sufficiently high to prevent the toe from coming into contact with the ground; but this is very different from what is called high action. My objections are intended to apply entirely to those which are denominated high-steppers. I would avoid all such as much as the daisy-cutter. The medium course is the only safe one. If the horse lifts his foot clear of the road, and lays his heel first to the ground, he cannot fall, as

stumbling is usually occasioned by sticking the toe into the road, or striking it against a stone, just as the foot is being brought down into contact with the surface. A horse seldom, if ever, falls in the act of lifting his foot, simply because in that position he has no weight depending upon it. He will fall only when he places the toe on the ground before the heel. Under these circumstances, a slight obstacle will bend the pastern forward, and, as the weight of the body is now intended to be thrown on the limb, away he goes. Let the horse with a well-slanted shoulder and pastern throw his foot well forward, and then bring his heel first to the ground, and I will answer for his safety. He will also stand more work than the very high stepper, whose peculiar action is certain to inflame his feet, as well as to promote the development of a variety of diseases to which the fore-legs are liable. Of course the observations I have made are applicable to shape and action alone, and have no reference to those cases where a fall is caused by the pressure of a sharp stone on a tender and diseased foot. It must be evident, a case of that sort is very different from one of ordinary tripping. The one is the result of disease, the other of development or form.

THE BACK.

Public opinion has long since decided that the weight-carrying properties of the horse depend, in no small degree, upon the length and shape of his back. The carter, the hackney, and the hunter, must not be very long in the back; and, in my opinion, extreme length in this part is not desirable even in the racer. It is a maxim in the sporting world, with which I fully agree, that the race-horse must have length somewhere, or else he would be deficient in stride, which would be a matter of serious consideration in a race of two or three miles. The difference of a few inches at each stroke would make a decided difference at the end of the race, unless the horse with the short stride could strike oftener than his opponent. There can be no doubt that a long stretch is of great importance. The question, then, naturally arises, how is a moderate length of back to be rendered compatible with great length of stride? Simply in this way — a deep, well-slanted shoulder, and very long quarters, will place the legs in such a position that there will be ample space below, whilst the back may be of a moderate length and very strong. This conformation is always connected with a fair amount of stride, and great weight-carrying abilities. A horse of this description may not always answer the purpose on a Leger-day; but if he is fortunate enough to have speed for this event, he is sure to

turn out a valuable animal when he afterwards comes to be entered for the different handicaps, where penalties, in the form of additional weights, are placed upon winning horses. His compactness may here carry him through with flying colours, and be the means of raising his character to the highest pitch of celebrity; whereas, the very long-backed Leger winner may be a flyer on the day, and never afterwards do any good. He may be first-rate with 8st. 7lb. on his back; but 12st. will probably bring him to a stand still.

The back is composed of a number of short bones united together by an elastic substance, for the purpose of giving elasticity and ease to the motions of the animal under the rider. It therefore resembles a spring, which will be easily bent, or otherwise, according to its length. Every inch added to the length of the spring, takes away from its power of carrying a weight attached to its centre. So is it with the back of the race-horse. When going at full speed, he can take in twenty-one feet at each stride; and, of course, when he is extended in this way, a trifling difference of weight on the centre of his back will make an enormous difference in the amount of exertion required to draw himself up speedily again for another stroke. Hence, we can easily account for the well-known fact, that two pounds extra added to one of them will invariably determine the result of the race, where the horses engaged are exactly matched at equal weights. In

this view of the case, it must be evident that the length of the back is a matter of considerable importance. I have come to the conclusion that a horse, no matter for what purpose he is intended, should not have an extremely long back.

The cart-horse requires a short back, to enable him to sustain his load; and the long-backed hunter will be sure to give up in heavy land during a long run. Just imagine a long-backed carter bending under a ton and a-half, or a long-backed hunter ploughing through wet land, with fifteen stone up, during a sharp burst of eight or ten miles! Let us not go, however, from one extreme to another, by choosing a horse whose back would be covered by an ordinary-sized saddle. Of the two extremes, this is, perhaps, the worst. An animal thus formed could not possibly have speed, or ease of motion. His hind-feet would be in constant danger of catching on his fore-shoes during the gallop or trot. He would likely have recourse to what is called "forging," and he would also run a good chance of getting his feet entangled in such a way as to cause a regular capsize, if going on deep, sticky ground. This would be still more certain to occur, if his back were elevated in the middle, which is a point of great deformity.

"We never can know," says Harry Hieover, "under what weight a horse can go, but by trying him. We may, in a general way, form a tolerably correct guess

at it; but if we trust to *appearance* of strength, or the want of it, cases will occur where we shall find such appearances quite deceive us." To a certain extent, this observation is perfectly true; but I am certain the mistake is often attributable to our careless, inaccurate, and imperfect observation. It is questionable if it is ever the result of an error in the formation of the animal. In the very nature of things, structure must tell truth; but it is often extremely difficult to draw accurate conclusions where so many things are to be taken into the calculation. The back is not the only part concerned. The question is not what weight can a horse stand under, but with what weight can he go? This at once involves every imaginable particular about the *formation* and *temperament* of the animal; and hence opens up so wide a field, that it is often extremely difficult, if not impossible, to arrive at precise conclusions by mere inspection. Although inspection, in the majority of cases, is of the greatest importance, still it must be admitted that, owing to the imperfection of our powers of observation, trial is the best proof.

It has long appeared to me, that the power of the horse's back might be materially improved by having him gradually accustomed to carry an increase of weight. Training, or work, if judiciously conducted, will increase the strength of the entire muscular system. Consequently, I can see no reason why the

muscles of the back should not be increased in power, by being accustomed to a gradual increase of weight. If this were done with sufficient caution, it would be the means of adding to the thickness and strength of the muscles of the back. The preservation of the legs is the only obstacle in the way; but this might be got over by keeping the horse, during the time of his work, at a moderate pace. At all events, the matter is worthy of consideration and investigation. My attention was first directed to the subject, by observing the great facility with which sacks of grain are carried from place to place in the market on the backs of *practised* individuals, when compared with men who, although apparently strong, are inexperienced in the work. There can be no doubt the muscles of the back, by regular exercise, are brought to carry weights with ease which they could not at first endure.

The back should present a gradual and gentle elevation over the kidneys. If there is a hollow here, the part must be weak. The elevation, however, requires to be moderate and gradual — never sudden. A gradual sweep is indicative of strength; an abrupt rise is connected with weakness, as the bones of the back are not well adapted to each other.

In order to form a correct estimate of the shape of the back, we must view it on the side, from behind, and in front. From these positions, we can see it on every part. The withers ought not to stand very much

higher than the top of the rump; in the racer and carter, no higher at all. The back should be nearly level on the saddle-seat, and then rise gradually over the kidneys. The ribs, by all means, must stand straight out from the back-bone all along. This is a much stronger and better form than the herring-rib, which makes a horse narrow and thin along the back. Some horses dip so much at the saddle-seat, that they have the appearance of a high shoulder; whereas, in reality, the shoulder may be low when compared with the top of the rump. The back-bone and ribs, behind the shoulder, should be considerably lower than the top of the withers, but the sweep should be gradual. A sudden and great dip at this locality is certainly a defect, as it encroaches on the space allotted to the lungs, and also permits the saddle to get forward on the top of the shoulder-blades. The two points of importance are, immediately behind the shoulders, and over the kidneys. The horse which is remarkably hollow in the first and weak in the second, is decidedly faulty.

The strength of the back, at the kidneys, will depend upon its gentle elevation, and also on the length of the transverse processes of the bones of the spine. The longer these processes are, the broader will the back appear at this part. If these projections on the bones of the spine are long and large, there will be plenty of room for the attachment of muscles and li-

gaments, on which the strength of the part greatly depends. Although not by any means so often looked to, this is a point of far more importance than the distance which intervenes between the last rib and the bones of the hip. A horse *may* be strong, although there should be a considerable space at the short rib; but no horse *can* be strong if his back is very narrow over the kidneys.

When the ribs approximate closely to the bones of the haunch, the horse is said to be ribbed home. This is certainly an advantage in the carter, and if in a moderate degree, in the hackney and hunter also; but it should never be the case in the racer. The racer must have plenty of room to throw in his hind-quarters in the gallop, and therefore requires a considerable space at the short rib. If he is tight here, he will be so confined in his action, that his stride must be short. Any person may be convinced of this fact, by observing a thorough-bred horse in his gallop. When he is going well, and sweeping along smoothly, the stifles will be seen to approach very nearly to the flaps of the saddle at each stroke—a thing which could not occur if he were completely ribbed home. The hunter can bear to be closer here than the racer, because he is chiefly valuable for his durable, weight-carrying, and jumping properties.

THE ABDOMEN.

THE abdominal cavity contains the stomach, intestines, liver, spleen, kidneys, &c. As its contents are variable in size and numerous, it is evident its parieties ought to be both elastic and extensive. It is therefore only in part surrounded by bone. The back ribs should be long and well arched, in order to afford a wide and deep space for holding the stomach, liver, bowels, &c. The condition of this part is a good and well-known indication of the feeding propensities of the animal. A puny appetite is the usual concomitant of short back ribs; but when they are long and wide-set, the horse is generally a greedy feeder. In the latter case, there will be sufficient room for large digestive organs, without encroaching on the cavity of the chest. There will be a good bread-basket.

I may just remark here, that horses frequently have their wind broken by being put to fast work when their stomachs are full of either food or drink. If a horse is about to get a brush of a trot or a gallop, he should be allowed time to empty his stomach before being taken out, and he should not, on any account, be permitted to drink. There can be nothing more dangerous than the common practice, about country stables, of galloping the horse home from the river at which he has been allowed to satiate his thrist. This practice should be

considered an unpardonable offence on the part of the servant, if persisted in, as it is extremely liable to injure the horse's wind.

POSITION OF THE BODY.

In forming an estimate of the appearance of the horse, we should pay attention to the relative position of his body and limbs. The body should give a distinct impression of being placed *on* the limbs—not suspended *between* them. If the body is placed *on* the limbs, the horse will have the power of doing his work within himself, as it is termed, and will not be easily fatigued. But, on the other hand, the horse whose body is swinging, as it were, between his limbs, will have a very slack, uncomfortable gait, and will be very easily fatigued. He will have a long, loose, showy action, which would lead the casual observer to imagine he was going at a tremendous pace; but a few miles of fast work would make him drag his legs heavily after him, and, in a long run, he would give up with downright exhaustion before his journey would be more than half-performed. He might have great speed for flat, short races, but he would not be fit for any other purpose.

THE HIND-QUARTERS.

It is often said regarding the horse, "If his fore-quarters are good, the hind-quarters will be sure to follow them." This is a remark to which I cannot altogether assent. It very properly places a high value on the perfection of the fore-quarters; but it does not follow from this that the hind-quarters are to be overlooked or undervalued. The horse which drags his hind-legs after him will be good for nothing; he is of no use on the course, in the field, or on the road; and his capabilities in the cart will be very limited. He will always be abroad in his gallop; and his hind-legs will be drawn along in the same way as if he had received an injury in his spine. The man who would attempt to ride him over a five-barred gate would require to have his life insured. His action will be weighty, sluggish, and disagreeable. Not so, however, with the horse whose hind-legs are so placed that he can gather them close under him in the trot or gallop—in such a manner that he can pitch off with freedom, making use of the fore-limbs solely for the purpose of receiving the weight of the body, which is propelled onwards by the action of the hind-quarters. A horse of this description will go beautifully, and with a freedom and ease which cannot fail to strike the attention of the observer. He will be light and corky in his action, and leaping will give him no trouble.

"The fore-limbs," says Mr. Percivall, "perform one office in progression, the hind-limbs another. While the latter are exerting themselves, after the manner of two powerful levers, to propel the animal machine onward, the former have little else to do but, while they are keeping pace with the hind-limbs, to carry the fore parts of the body, together with the head and neck, in their elevated position—support them, lest they fall to the ground." The slightest attention will enable a practical observer to see that the spring in the leap is always made from the hind-legs, and that too even after the fore-quarters have been raised from the ground. Hence the absolute necessity of power in this locality. Still the fore-legs require to be strong also, for the purpose of receiving the weight of the horse, with his rider, when lighting on the off-side of the fence. A horse whose fore and hind-quarters are both good loses very little time by *dwelling* on his leap. The steeple-chaser of this description has a very great advantage. If he comes to a head-and-head contest, at the last fence, with one who is defective in the corresponding points, he is quite sure to win. He loses so little time at his leap that he will gain nearly a length on his adversary before reaching the winning-post. The horse which requires to dwell on his leap, or in other words, which requires a length of time to gather in his hind-legs after he has got over his fence, before starting in the new, allows an advantage to his op-

ponent that cannot easily be compensated for. The animal with first-rate hind and fore-quarters will get over his fences, and start again, so nimbly that a person would almost imagine he was going on smooth ground. He will not dwell either in taking his leap, or in recovering from its effects.

It matters not for what purpose the horse is intended, he is no favourite of mine unless he has a well-shaped, lengthy, and strong hind-quarter. This must be the point, or fulcrum, from whence his effort proceeds.

That the carter requires great power behind is proved by the fact, that he cannot pull his load up the hill, especially during frost, unless he is well prepared in the hind-feet. He must have sharp toe-pieces on the hind-feet shoes to catch the ground, although such contrivances may frequently be dispensed with on the fore-feet. Does not this prove that the power comes chiefly from behind? Again, look at the waggon-horse starting his load on the railway, when he is obliged to use the greatest effort of which he is capable. Is it not plain to be seen, with half an eye, that the great moving power resides in his hind-quarters? The effort he makes with them is prodigious.

Every horse intended for galloping and leaping must be furnished with good hind-quarters. Galloping consists merely of a succession of leaps; and no animal

can leap well if he is deficient behind. Look, for example, at the kangaroo, the hare, the greyhound, the cat, and the tiger. Can any formation exceed their hind-quarters in strength and leverage power; and are they not proverbial for their power of leaping and running? As might be expected, their action is in perfect accordance with their form. So is it also with the horse. When supplied with good hind-quarters, he can perform wonderful feats. It is well authenticated that Vainhope took a leap measuring thirty-four feet in width; and we are informed by the celebrated Nimrod, that "In 1821, Mr. Mytton's horse, 'The Hero,' cleared *timber* seven feet in height, with a very short run to it, in Mr. Jellico's grounds in Shropshire, with Mr. Mytton on his back." Such performances could not be accomplished without an adequate power behind.

If we wish to form a correct estimate of the development of the hind-quarters, we must pay special attention to the length, shape, and position of the bones, as well as to the length, size, and direction of the muscles. The bones constitute so many distinct levers; whilst the muscles are the powers by which these levers are put in motion. When the bones are short and unfavourably placed, the muscles cannot act upon them with sufficient power, or to the best advantage. If the muscles are long from their origin to their termina-

tion, their contraction must be proportionally great. On this depends the extent of the spring or stride. Hence, length in every part of the hind-quarters where muscles are located, is of infinite importance.

THE HAUNCH, OR RUMP,

should not be either extremely narrow or extremely broad. If it is very narrow, there will be a great want of power; and if it is too broad in proportion to the rest of the frame, there will be much more force than what is required, or can be borne by the remainder of the machine, and the horse consequently is carrying useless lumber. The haunch-bones should project a little at each side of the flank, but not to such an extent as to make the horse ragged-hipped. When the vertebræ, at the kidneys, extend outwards on each side as far as they ought to do, this is not likely to occur. Great strength in this locality is absolutely necessary in every description of horse.

The bones of the haunch, which extend from the kidneys to the point of the hips, can hardly be too long. This ought to be specially looked after in horses intended for fast work. If they are short here, they will be equally short in their stride. On a side view, the top of the rump should present a moderately arched form from the kidneys to the setting on of the tail. This is a point of some utility and of great

beauty. The tail ought not to be set either very high up, or very low down. The side bones of the haunch should descend considerably below the level of the setting on of the tail, as they pass backwards to form the points of the hips. This I insist upon as a vital point, although I am at variance regarding it with public opinion. By all means, give me a horse with a moderately-drooped rump. Let other parties say what they may, this is the sort of horse which will please the turfite, and the fox-hunter. I hardly ever saw a good racer or hunter which had the side-bones of the haunch perfectly level. If you look at a horse of this description taking his gallop, you will observe the legs sticking out behind him, the root of the tail elevated, and the back depressed at the kidneys. He drags the hind-quarters after him, and is badly formed for carrying weight.

Not so, however, with the horse whose rump is drooped, or, in other words, whose haunch bones, as they pass backwards, descend below the level of the arch formed by the vertebræ of the back as they reach the tail. This certainly is the horse to go. The onlooker is delighted with the swimming action of his gallop. He has not the slightest difficulty in getting his hind-feet under the weight he has to carry, and he is able to throw his stifle joints nearly as far forwards as the flaps of the saddle. In every way, he has full command of himself. When jumping, he will be able

to pop off his hind-feet like a ball; and when galloping, he will be so collected in his stride, that his back will never get depressed with the weight of his rider. "It is worthy of remark," says Riddlesworth, at the eighth page of *The British and Foreign Book of Sports*, for 1843, "that high hind-quarters, and tail set on low, are generally characteristics of good qualities in a horse." Such is the formation of all our best racing and jumping horses. It is seen in perfection in that model of a race-horse, the Flying Dutchman. To prevent misapprehension, however, I may again observe, that it is the side-bone of the haunch which requires to be drooped as it approaches the point of the hip. The position of the vertebræ which join the tail is not nearly of the same practical importance, although it may affect the beauty of the outline. Many horses have their haunch-bones well drooped, whilst their tails are set-on high up, and nearly level with the top of the rump.

THE THIGH

bone extends from the termination of the haunch-bone, below the tail, or, more correctly speaking, from the hip joint, to the lower edge of the flank, where its end assists in forming the stifle joint. This bone is altogether imbedded in a dense mass of muscular substance. It does not attract much attention from the cursory observer; nevertheless, its importance is over-

whelming. It is connected with the most powerful muscles of the body — muscles which are obliged to propel the entire machine. The longer this bone is the better. Its length assists in governing the stretch of the hind-quarters. When it and the haunch-bone are both short, the horse may probably possess sufficient strength; but he must undoubtedly be short in his action. He will have to strike very often to make amends for this defect. But the case is reversed when both these bones are long. The horse can then afford to strike slower. He will have a long and sweeping stride, and he will gallop with greater speed, and much more ease.

The muscles in this region should be both long and large. The horse in whom they are weak is radically defective. Short muscles, if they are strong enough, may do for slow work; but without length, they are of no use for speed. Their length can easily be ascertained by observing the distance which intervenes between the haunch-bone and the thigh-bone, as well as the distance from this last point to their termination above the hock. This is a correct measurement of their length; their size can be judged of by the thickness of the parts which they compose.

When viewed from behind, the muscles which lie on the thigh-bone should be very large and prominent, both inside and outside. It is impossible for them to be too strong. The horse that is very thin and flat here, and

consequently scanty of muscle, is a regular weed — he is good for nothing. Strong muscles are required both inside and outside the thigh in every description of horse. There can be nothing more important or beautiful than a large development of muscle on the outside of the thigh-bone. It is always a point of great attraction in the racer or hunter, in whom it must, of necessity, be developed. In some cases this part appears better developed than it really is, in consequence of a bend in the outline of the bones. This is no advantage, and it must not be confounded with a well-thrown out muscle. The thigh-bones ought to lie at a reasonable distance from each other; the space between them should be well filled up with muscular substance, and the muscles on the outside should project in a very prominent and well-marked form.

Having inspected the quarters from behind, we must take a look at them on the side. We should see that the stifle-joint extends far forwards, and is situated low down. This arrangement, by removing the stifle to a greater distance from the pin-bone, as well as from the front of the haunch-bone, increases the surface for the attachment of muscles, adds to their length, and improves their leverage position. The farther these points are distant from each other, as a matter of course, the longer and more numerous will be the muscular fibres which extend between them.

The distance from the stifle straight across to the

back edge of the hip must be observed. The greater it is, the more muscular substance will the space contain. Some of the muscles at the back edge of the hip are of great importance. They ought to be so well defined, so prominent, and distinct, that their detection on the living animal will present no difficulty. In the high-bred horse they are generally extremely well defined. They ought to be as long as possible; the farther they reach down towards the hock, the better. I never like to see them turning in suddenly to the bone a little below the stifle-joint. It adds greatly to the beauty, as well as to the power, of the hind-quarter, to have these muscles very long and prominent from their origin, at the root of the tail and about the hip-joint, to their termination in the bone above the hock. Length in all the muscles of the hind-quarter is a particularly gratifying thing in the eye of every judge of the horse. To have sufficient speed and propelling power, there must be length, substance, and favourable leverage.

THE TIBIA,

or lower bone of the thigh, reaches from the stifle-joint to the hock. For speed, it requires to be long; the hock can hardly be too close to the ground. The stifle-joint, corresponding to the knee in the human subject, is formed by the connexion of the tibia with the upper thigh-bone. It is a very important joint, and requires

to be both strong and sound. Injuries of it are very serious in their consequences.

Besides being long, and directed backwards, the tibia must be furnished with plenty of muscle. All the muscles which move the parts beneath the hock are located on it. Hence it is evident, if it is defective in muscle, the want cannot be supplied from any other source. There is no scarcity of sinews farther down, but muscles there are none. Every horse should be furnished with a sufficient mass of muscle on the tibia, to give the appearance of great breadth and strength. The one which is narrow and weak here is radically defective. It is in vain to think that poverty in this locality can be compensated for by perfection elsewhere, because no other part performs the same functions. There is no such superfluity in nature, as that a good part can compensate for a bad one in this sort of way. Every part has its own peculiar office to fulfil, which is quite sufficient for it without attempting to do the duty of its neighbour. The muscles should be well developed *inside*, as well as outside, the tibia. The most powerful formation of this description I have ever seen was in Touchstone. His strength at this part was remarkable — particularly as regards the muscles on the inside. The muscles of the tibia terminate in sinews, some of which are inserted into the point of the hock, but the greater part of them passes on towards the foot.

I have already said the extent of the stride depends on

the length and position of the bones, or levers, as well as on the length and position of the muscles which move them. When they are all short, the stride will be short; but when they are all long, the stride will be long also. This observation is particularly applicable to the condition of the hind-quarter. Its mechanism is most beautiful and important. All horses must have plenty of substance here; but all do not require the same length, just because all do not require great speed, although they all need plenty of strength. Those which are intended for slow work would not be injured by length, but still they can do well enough without it. The chief thing for them is, to have abundance of strength, which is connected with substance; consequently, it will answer our purpose to have them short and thick. Not so, however, with racers, hunters, and saddle-horses. As they require weight-carrying powers, combined with durability and speed, they must, of necessity, have both substance and length. The difference, in comfort and speed, between a short-actioned horse and one with an immense sweeping stride, is far greater than any inexperienced person would ever imagine.

The longer a horse is from the kidneys to the hip-joint, from the hip-joint to the stifle, and from the stifle to the hock, the greater will be the extent of ground he can cover at a stroke. Just throw him into action, and watch him carefully as he draws the stifle

up towards his kidneys, and the hock towards his tail. You will then be able to judge of the extent of pitch he will get when these parts are all brought suddenly back, like the spring of a bow, into their natural position. If the haunch-bone and the two thigh-bones are all long, and properly placed, they will form such angles as will give a crooked appearance to this part of the quarter. This, so far from being a defect, is a matter of great advantage, inasmuch as it places the hind-foot in a favourable position for bearing the weight it is obliged to sustain; whilst, at the same time, a great leverage power is preserved. A horse in whom the outline of these bones is straight, will not possess speed, nor yet have the power of getting his hind-feet sufficiently far forwards under his body; in short, the horse should be formed here very much after the model of that most beautiful creature, the greyhound. I quite agree with the celebrated Nimrod, who says, "You may as well expect an ass to play the fiddle, as a horse to carry his rider pleasantly, unless he have good lengthy shoulders and well-bent hinder-legs. A friend of mine, who is become fastidious in his judgment, goes so far as to say, that no horse can have a good mouth with straight hinder-legs. He is so far correct, inasmuch as no horse with straight hinder-legs can pull together; therefore neither his head nor his heels can be where they ought to be, and consequently he can never be fit to carry a gentleman."

THE HOCK.

THE public have very properly attributed as much importance to the formation and soundness of the hock as to that of any other joint in the body. This is not to be wondered at, when we consider that in nine cases out of ten it is the seat of all the lameness which occurs in the hind-quarter. The case is just the reverse in the fore-quarter, as in the vast majority of instances the lameness there is situated somewhere between the knee and the ground.

The leverage of the hind-quarter is so favourable, and the propelling muscles are so powerful, that the hock-joint, in order to remain sound, requires to be remarkably well-formed. It must decidedly be large, coarse, and well-developed in all its parts. No matter how well and smooth it may look, if it is small it will not stand severe work. Many parties are afraid of large, coarse hocks; but they are certainly astray. Without size, the hock cannot have strength. Let it be large, and, at the same time, properly proportioned in all its parts. The greatest evil arises from having some parts large, whilst others are small. Such a formation will not do. Everything should be on a balance. The larger the bones are which enter into the composition of the joint, the more extensive will be the surface presented by them for the attachment of those powerful ligaments which are required to keep them in their

places; and the greater will be the space over which the concussion caused by powerful action will be distributed.

The heel-bone, or the bone which forms the point of the hock behind, can hardly be too long. Every inch added to its projection upwards, adds greatly to the leverage power of those immense sinews which are inserted into it. This is a positive advantage gained, and it is a point well worthy of attention. It is also highly desirable to have this bone strong and large. The sinew which runs from its point up towards the thigh requires to be very thick, and it should stand well out from the thigh-bone.

The end of the lower thigh-bone should run into the hock-joint at an angle, and not in a perpendicular manner; but with this the angular form must cease. The leg, from the point of the hock behind to the upper end of the pastern, should be as straight as a plumb-line. If it is rounded in the slightest degree, the back sinews will work at a disadvantage. It is extremely probable the horse will get curbed.

As the back-sinew runs down along the edge of the hock-joint, it is kept firmly in its place by a special ligament, called the annular ligament, which is thrown directly across, at the lower end of the joint, from the one side to the other, for this very purpose. If the position of the bones allows this sinew to run in a perpendicular line, the transverse, or annular ligament, will be quite

able to bear the stress which is thrown upon it in making the spring for the gallop or leap; but if the joint, at this locality, is rounded in its form, or if the hocks are greatly turned in towards each other whilst the toes are turned out, the stress on the annular ligament will be so great as to sprain it; and perhaps the sinew will start completely from its natural position, and thus form a very unsightly tumour. This tumour constitutes a curb, which is a most serious and intractable affair. After it is really formed, I believe it is impossible for the joint ever to be made as good as it was at first. The application of Major's remedy, blisters, or the firing-irons, together with long-continued rest, will improve it materially; but still it can never be fully depended on again. A sinew which is not only severely sprained, but actually put out of its place, will be nearly certain of giving way again when it is called upon for sudden and severe exertion.

The best plan of judging whether or not a horse is curbed, is to take a fair side-view of the joint. The slightest elevation will then be distinctly seen. When there is anything suspicious-looking, the part must be carefully examined by the finger. Sometimes there is an appearance of an incipient curb towards the outside of the joint, although there has been no starting of the sinew, or sprain of the ligament. A horse must not always be rejected as unsound on this account, but he is to be regarded with a deal of suspicion. His hocks

are ill-formed. As there is no starting of the sinews, or sprain of the ligaments, they are not really curbed; but their formation renders them naturally liable to it, and their capabilities for standing work are uncertain.

I have already said the bones of the hock should be large, strong, and coarse-looking. Those which lie at the seat of spavin should not be an exception to this rule. They are certainly much less liable to disease when they are large, than when they are small. The main point is, to see that they are precisely the same size and form in each leg. Joints which are *uniformly* strong and coarse-looking, are not very likely to go astray; whereas the smooth, neat, small, and tidy-looking joints, generally stand very little work without becoming diseased. The diseases of the hock are numerous and interesting; but they are altogether foreign to my present purpose, and therefore cannot be discussed. They are treated of in a very lucid manner in the writings of Mr. Percivall, to which I have much pleasure in referring my readers.

I believe it has been shown by Mr. Percivall, Mr. Goodwin, and Mr. Youatt, that it is a mistake to imagine a horse is never spavined without exhibiting an external enlargement of the joint. Theoretically, this opinion is very probable, because there can be no reason why inflammation, ulceration, or bony deposit might not take place at any one point of the whole hock-joint.

The enlargement occurs only when the osseous deposit commences at the surface, or extends itself outwards in that direction, after having begun internally. I have a most interesting specimen of hock-joint disease in my possession. It was taken from a horse which, when alive, was decidedly and unequivocally lame in the hind-leg, although there was nothing to be seen to account for the disease. The joint looked and felt quite smooth. I have preserved all the bones of the hock. They are as regular and smooth as they ought to be externally; but the small bones, at the seat of spavin, are firmly and permanently united, by a very evident bony deposit, at different points on their internal approximating surfaces. They are thoroughly anchylosed. The inflammation connected with this state of matters, and the union of the bones, were quite sufficient to account for the lameness and stiffness of the leg; in fact, the horse, to all intents and purposes, was spavined, although there was not the slightest external enlargement to be observed either before or after death.

In general, spavin arises from a defective formation of the joint; but this is not by any means uniformly the case. I am certain some horses possess a *scrofulous* constitution, and therefore by nature are prone to diseases of the bones and joints. In such instances, if my opinion be well founded, spavins will frequently occur, no matter how perfect the shape and size of the

joint may be. To my thinking, this is a very fruitful source of the disease.

Injudicious shoeing is another cause of spavin. When the horse is disposed to brush, the smith usually raises him higher on the one side of the heel than on the other. This may so far change his action as to prevent the brushing; but it throws so much more weight on one part of the hock-joint than on another, that disease may almost be said to be the inevitable result. I wish these smiths had the one side of their boot raised an inch higher than the other, in order that they might enjoy the same pleasure which they have conferred upon the horse. They would then, especially if forced to run and jump, have an opportunity of knowing how long their ankle and knee-joints would continue sound.

The perfection of the hock further requires that the end of the shank-bone which joins it should be large and well developed in every direction. When the shank is small, narrow, and contracted, the bones of the hock have not a sufficiently extensive surface to rest upon. This is a very frequent cause of spavin. Some horses are so ill-formed here that a person, on taking a side view, might almost imagine a piece had been pared off the front of the shank-bone immediately below the hock-joint. This is a formidable defect, as the bone should be very broad here, for the purpose of carrying the joint. The greater the measurement, from before

backwards, at this part, the better, and the less liable will the animal be to curbs and spavins. Llanercost was particularly beautiful in this point. There was plenty of room for the attachment of ligaments, and the hock had a broad, firm basis to rest upon.

It is a sign of bad feeding, constitutional weakness, or a strong disposition to local disease, when the quantity of sinovial secretion in the hock-joint is superabundant. If anything can add to the beauty of a well-formed, large joint, it is that of its being clean, hard, and free from tumefaction of every kind.

THE SHANK.

The shank-bone should be short, broad, and flat. This arrangement will give strength, and, at the same time, bring the hock near to the ground. The back-sinews ought to stand well out from the bone. In a well-formed leg, these sinews are plain and distinct, and feel as hard as cords. I have already alluded to the proper form of the upper end of the shank-bone, where it joins the hock. The lower end requires to be strong also, in order to form a strong connexion with the pastern. Taken as a whole, from the hock to the heel, the shank should be short, straight, broad, flat, hard, sinewy, and wiry-looking. It is a bad sign of the constitution to see it round, gummy, and soft-looking.

THE PASTERNS.

THE hind-pasterns should be longer, stronger, and more slanted than the fore ones. They require to be very springy, still possessing plenty of strength to prevent the end of the shank-bone, even under the greatest possible efforts of the hind-quarters, from coming into contact with the ground.

THE HIND-FOOT

is so much less liable to disease than the fore one, and the difference in its form is consequently so much less important, that I do not think it necessary to dwell on its peculiarities.

The hind-feet should be set down firmly under the horse, and the hocks ought to incline a little towards each other. It is a great indication of weakness, when the hocks twist outwards during the motion of the hind-legs.

JUDGING THE HORSE.

I HAVE now gone over all the points of the horse in detail; and I think those parties who take the trouble of carefully reading my remarks, in connexion with a practical examination of the various horses which daily fall under their notice, will be able to form an opinion of the animal's development and peculiarities upon a correct and rational basis.

In forming an estimate of any particular horse, it is a good plan at first to take a general and rapid survey of his outline. The first impression is frequently worthy of attention; but if it is not well founded, it can easily be rectified afterwards. After this cursory inspection, it will be well to examine every important point in detail, keeping steadily in view the peculiarities of form which the animal should possess, for the purpose for which he is designed. A horse ought always to present such distinctive features as will at once set him down for some specific use. If he is a nondescript animal—fitted for one purpose in one part, and a different purpose in another part, but for nothing on the whole — if, in short, he has neither trade, profession, nor occupation, the sooner he is thrown to the dogs the better. Let the perfections and imperfections of every point be carefully observed in detail, and then the observer will be in a position to rectify or confirm the first impressions which he received. It will even be necessary to take a second look at the general outline, for the purpose of observing how the most important parts are fitted for, and connected with each other. Nothing could be of more consequence than the proportional development and exact balancing of the different parts of the machinery. It is the rarest thing imaginable to find a horse well proportioned throughout; but when he is found, I would recommend the owner not to part with him on any account.

Before coming to a final decision, it is unquestionably necessary to put the horse into motion. He is not to be examined merely as a bullock in Smithfield; he must be walked, trotted, or galloped, as the case may require. If we have made any mistake in regard to his constitution and form, we will be materially assisted in rectifying our error by seeing him in motion; besides, independently of his natural action, we will then have a good opportunity of judging of his soundness. During the time he is under inspection, he ought to be allowed to go along quietly, with a free head and a loose rein. He will then show those defects which are so frequently hid by the whip, hand, and spur of the experienced jockey.

I have often been surprised to see that the horse which is good in some parts, and defective in others, will please the public much better than the one which is well formed and properly proportioned throughout. It requires accurate judgment and close inspection to form a correct estimate of the perfect horse. He is so evenly balanced, and so accurately put together, that he does not present any special point to catch the eye; but the one which is great in some points, and bad in others, will be sure to arrest the attention of the casual observer. The good parts appear so remarkably fine, in contrast with the bad ones, that they cannot be overlooked; in short, they frequently blind a person to the animal's defects. This, however, does not happen

to a really good judge. His keen and well-trained eye at once lights upon the sore spots. In his estimation a few good points cannot make amends for radical defects. He will choose the horse which can bear minute examination, although there will be less show with him, in all probability, than with the one which is good here, and bad there. Hence we can easily account for the fact, that the horse which pleases a good judge does not generally satisfy the public taste.

Although not by any means faultless in all his points, the far-famed Flying Dutchman was one of the best-proportioned horses I ever saw. His style of galloping was consequently nearly perfect; his form was so good, and his points were so accurately balanced, that he gave a person the impression of his having both pace and distance. He was neither too light nor too heavy, too large nor too small; his fore-quarters were in proportion to his hind-quarters, and his hind-quarters in proportion to his fore-quarters; his body was not too heavy for his legs, nor his legs too clumsy for his body; he always appeared to have his long and beautifully-drooped hind-quarters well under him in the gallop, whilst he had full command of his forelegs. His action was so low, so smooth, so graceful, and so perfect, that no person who saw it, as he swept along, could fail to admire it, nor could he ever forget it. I verily believe he never had a superior; and if I had been in the place of that most honourable of sportsmen,

the Earl of Eglinton, who owned him during the entire of his racing career, I would not have parted even with a share in him for any ordinary consideration. We must all admire the noble spirit of the Marquis of Westminster, who, when solicited to part with Touchstone to the Germans, sent the reply, that "A German principality should not buy Touchstone."

ON BREEDING.

It would be foreign to my present purpose to enter at full length into the subject of breeding. Nevertheless, I think it advisable to make a few observations on this most important question.

PRINCIPLES APPLICABLE TO BOTH SIRE AND DAM.

Breeding from unsound stock is, perhaps, the most serious, as well as the most usual, mistake into which people have fallen. No rule in the living economy is better established than the law of the hereditary transmission of qualities. I do not wish to be understood as asserting that the actual disease is communicated, but merely that such a peculiarity of constitution or form is handed down from generation to generation, as renders the offspring extremely liable to the same diseases as their parents, whenever they are exposed to suitable exciting causes. Indeed, I might almost go the length of saying that, viewed in this light, every-

thing which is not purely accidental is hereditary. No one, of course, would believe in the transmission of a real accident, such as a fractured bone or a dislocated joint. We must be careful, however, of admitting into the list of accidents such things as spavins, curbs, ringbones, roaring, wind-breaking, &c. These can never properly be considered as accidental, although the excuse is frequently made on their behalf, that they occurred from a wrench, stress, fall, or some violent and sudden over-exertion, for which the animal is not to be blamed. For my part, I would never be hoodwinked by any excuse of the kind, no matter by whom it may be preferred. I would invariably trust to the horse who goes through all his trials and severe work at all ages, and turns up quite sound at the last. This is the animal whose form and constitution are to be depended on. He can speak for himself, and needs no interested advocate. If two animals are getting the same care, and doing the same amount of work, and one of them bears it without injury, whilst the other breaks up, there surely can be no question that the one is more perfect in his construction than the other. I would listen to no apologies for the bad one. There is a reason in nature for his going astray; and it makes little difference whether that reason depends on softness of constitution, defective structure, or imperfection of form. It is somewhere in the organization, and is sure to be hereditary. Some diseases are so trivial in their

nature, that we need not pay much attention to them; but many others are so serious in their consequences that we should never overlook them. Broken wind, ringbone, curb, spavin, scrofulous disease of the joints, affections of the windpipe, and several diseases of the eye, are so important and so decidedly hereditary, that they should unquestionably be avoided, except under some very special circumstances.

The temper demands special attention. A fractious, fretful, flighty, dogged, or vicious disposition, is so vexatious, that it becomes a great drawback on the value and usefulness of the animal. All this depends on the state of the brain, and consequently is hereditary. In many cases it is easy to tell the sire or dam by the temper of the offspring. I have verified this observation in an immense number of instances. A fair combination of gentleness with courage is an invaluable quality; it makes amends for many other imperfections.

No consideration should induce any man to breed from a soft-constitutioned or weedy animal. There should always be firmness of texture, with plenty of substance and size, to suit the purpose for which the horse may be designed. The points which constitute the most useful parts must always be well developed. It is much better to have them a little in excess than deficient. Radical defects of all kinds are invariably to be avoided.

It is well to select animals of a medium age to breed from. They generally produce a more vigorous, healthy, and thriving offspring than those who are either very young or very old. This rule, however, does not always hold good, as there are some noted exceptions to it; for example, the Ugly Buck, winner of the two-thousand-guinea stakes, was foaled when his dam was only three years' old, and he was the best foal she ever produced. Cressida had Priam when she was twenty years of age, and Crucifix was foaled when her dam was twenty-two; Marske was thirteen when he got Eclipse; Orville twenty when he got Emilius; Voltaire twenty when he got Voltigeur; Pot-8-os sixteen when he got Waxy; Waxy sixteen when he got Whalebone, and twenty-one when he got Whisker; Whalebone fourteen when he got Camel, and eighteen when he got Sir Hercules; Sir Hercules fourteen when he got Faugh-a-ballagh, and twenty-seven when he got Gemma-di-Vergy; and Touchstone is still a favourite stallion, at twenty-seven years of age.

There is not the slightest foundation for the strong prejudice which exists in the public mind against in-and-in breeding. On the contrary, Mr. Smith has plainly established that, within certain limits, this plan is highly advantageous. Many of the best horses, as well as the best short-horned cattle, we have ever had, were very much and closely in-bred. To a certain extent this was unavoidable, when the studs and herds were

first formed; but it makes little difference whether it was the result of necessity, or of choice. It has fully established the immense advantages of breeding in-and-in, when the stock is of the right sort; indeed, I can see no other possible way of retaining the perfections of any particular strain than that of returning frequently to the same blood. If this principle had not been adopted, we would not now possess the advantage which was gained by the Waxy blood. When the out-and-out crossing is strictly pursued, the tenth generation contains only the one-thousand-and-twenty-fourth part of the original stock, which is a mere nominal affair. A very sensible writer, who signs himself "An Old Turfite," in the *Sporting Magazine*, places this in a very strong light, by adopting the following tabular form:—

1st	Cross contains	. . .	$\frac{1}{2}$
2nd	„ „	. . .	$\frac{1}{4}$
3rd	„ „	. . .	$\frac{1}{8}$
4th	„ „	. . .	$\frac{1}{16}$
5th	„ „	. . .	$\frac{1}{32}$
6th	„ „	. . .	$\frac{1}{64}$
7th	„ „	. . .	$\frac{1}{128}$
8th	„ „	. . .	$\frac{1}{256}$
9th	„ „	. . .	$\frac{1}{512}$
10th	„ „	. . .	$\frac{1}{1024}$

The practical result may not always correspond precisely with the arithmetical ratio, because the horse may

stamp his form so completely on his offspring, that it will not be easily got rid of; but still it will unquestionably run out in the course of time; and the more complete and violent the cross, the sooner will the peculiarities disappear. They can be retained only by frequent returns to the same blood; and by this plan we can reap all the advantages of good stock, without running in-and-in so very constantly and closely as to run any hazard of ever deteriorating the constitution of the animal. We must be careful, however, to observe that the individuals we select to breed from are as near perfection as possible, both in themselves and their ancestors. We will thus secure the transmission of their good qualities. On the other hand, if there is any special defect, it will be sure to pass down, when it is thrown in-and-in, and will hardly ever be got rid of. I think it is owing, in a great measure, to want of attention to this rule, that there is so much prejudice against close breeding. It will succeed only when the good qualities bear an immense preponderance over the bad ones. To those who wish for further information on this important subject, I would strongly recommend the perusal of Stonehenge's most admirable observations, in his "British Rural Sports."

Experienced breeders very properly place great reliance on blood. In short, this just amounts to the fact, that good and bad qualities are all hereditary. "Like begets like." No person ever saw a Clydesdale foal

got by a blood-horse out of a blood mare, or a short-horned calf by a long-horned bull out of a long-horned cow. Such a thing is never expected. If, then, these general characteristics are invariably transmitted, have we not some reason at least to conclude, that all things are hereditary. In fact, that the offspring will inherit, either in whole or in part, the most trifling peculiarities of their ancestors, sometimes taking more after the one parent, and sometimes more after the other, or being a mixture of both, as the case may be. Whatever the peculiarities are—whether soundness, disease, form, temper, softness, strength, durability, speed, wind, or any other thing—they pass down from generation to generation. For instance, the descendants of Waxy and Orville are characterised by pluck, distance, and durability; whilst the Selims are celebrated chiefly for speed. Again, to take an illustration from a very long line of the purest breeding, I may refer to the hereditary colour of Hereford and Devon cows. Who ever saw a Hereford without a white face, or a Devon of any other colour than a rich red? Here we see that the very colour of the animal runs in blood. Those who have an opportunity of inspecting Mr. Goodwin's highly interesting tables containing the pedigree of thoroughbred horses, will see at a glance that blood is most important. He arranges all the stallions of 1856 under three heads — the Darley Arabian, the Byerly

Turk, and the Godolphin Arabian. From these tables it appears that the Darley Arabian is represented, at present, by two hundred and five stallions of repute; the Byerly Turk, by seventy-six; and the Godolphin Arabian by twenty-four. Does this not plainly prove that the blood of the Darley Arabian is much more to be prized than that of the Byerly Turk, and the Byerly Turk than that of the Godolphin Arabian? It should surely lead us to place some confidence in pedigree. Moreover, the same table shows that the lion's share has fallen to the descendants of Waxy through his son Whalebone. Indeed, it might safely be said, that every good thoroughbred horse now in the world contains Waxy blood either by his sire or dam.

Whilst good blood is indispensable, it is not everything. "In breeding for the turf," says "Red Rover," in vol. iv. of the *Sporting Magazine*, "above all things it is necessary, in order to secure success, to consider closely the old crosses of blood; and to cross judiciously the stout with the speedy. Not that I think that, for the sake of blood, the form of an animal selected for stud-purposes should be held a second-rate consideration; but, each being well considered, the standard of excellence may better be attained. The fault of looking to blood alone is among many of our breeders the cause of such ill-success; as they look too much to the horse throwing back in blood, as the term is, and

not stamping his own form, which may be, and very often is, atrocious, but that of his sire, which might have been first-rate, on the stock." We should, by all means, keep to the good blood; but, at the same time, we must be careful to select the best specimens of that blood, if we wish to attain to high success. It is owing to a strict perseverance in this plan that Mr. Booth now occupies an unrivalled position as a breeder of short-horned cattle. He not only kept to the right strain, but he also invariably selected the best specimens of that blood for his own use, and refused to part with them at any price. This was a wise course, and the consequence is, his stock is now so highly prized, that he can command the market as he pleases. The fact of its having been bred by Booth is now sufficient to create a demand for *any* animal; and here, it appears to me, the public are running in direct opposition to Mr. Booth's own principles of action. The state of their pocket will some day point out their mistake. They will yet find that they not only require Mr. Booth's blood, but also that they must have such a specimen of that blood as would satisfy Mr. Booth for his own use. This is the point to be looked to; and these observations are quite as applicable to the horse as the cow. Take, for example, the case of own-brothers. Although the blood is the same, they never breed alike because they are not equally perfect in all

other particulars. Thus, Whalebone was far superior as a stallion to Whisker; Touchstone to Launcelot; Irish Bird-catcher to Faugh-a-ballagh; Selim to Rubens and Castrel; Epirus to Elis; and Simoom to Sea Horse. There are multitudes of facts to prove that, whilst we do not forget the blood, we should look to all other peculiarities.

THE MARE.

My previous observations embody general principles which are applicable to both sire and dam, and, in a great measure, to all the classes into which the horse is divided. I must now advert to a few things which apply exclusively to the brood-mare.

Unless the produce is intended for racing, or some other specific purpose, there is no necessity for the mare being clean-bred of her kind. In her case, a mixture will not only do very well, but in some instances it is actually desirable. It is important, however, that the crosses which are to be found in her should not be of a bad description, nor yet very violent, as she might then throw her foals too much after the objectionable strain, or else produce a cross-made, ill-proportioned, and useless brute, in consequence of the violent and incongruous crosses in her own pedigree. Daily observations, unfortunately, verify these facts.

No mare is so valuable for breeding-purposes as the one which throws her foals after the horse. The more completely she does this the better. It will then be our own fault if we do not get some valuable stock, as we have an almost endless variety of stallions to choose from. If she is an animal of the very first stamp, we would, of course, be anxious for the reproduction of her own form and constitution; but as mares of this description are difficult to be obtained, it is highly desirable to get one which will either throw after the horse, or back into some good strain in her own blood.

I never could understand on what principle those parties who maintain that "like begets like," could insist, as they all do, on the necessity of breeding from what they call *roomy* mares. If they are so roomy as to be out of proportion, their stock, both male and female, may be of the same stamp. They should neither be very roomy, nor very narrow; but as near symmetrical perfection as possible. The more evenly balanced they are, the more perfect is their offspring likely to be. If this is not the case, like does not beget like. It is absurd to suppose the perfection of the offspring depends on the extent of space it may happen to have for its habitation before birth. Its qualities will depend on the perfection of its ancestors, either immediate or remote. Unless we want an extremely roomy

foal, we should not choose an extremely roomy dam. There is nothing more required than that there shall be sufficient room to prevent deformity from position, which latter is a remarkably rare occurrence. If a mare is so narrow as not to be able properly to contain a foal, she is, in every point of view, such a thorough weed, that no man but a fool would select her for breeding-purposes.

The common, almost universal, practice of putting all sorts of mares to the same horse, cannot be too strongly reprehended. Breeding will indeed be a complete lottery so long as this plan is pursued. It requires a great deal of discrimination and judgment to select the most suitable stallion for any particular mare. On this hangs the chief part of our success. The crosses of blood, the size, the temper, the constitution, and the form, must all be well considered. Whatever faults exist on the one side must, as far as possible, be avoided on the other. If the same fault exists on both sides of the house, it is nearly certain of being handed down. It is a much better plan, however, to rectify an imperfection in the dam by selecting a horse as nearly perfect as possible at the same part, than to choose one who runs to the opposite extreme. It is an old saying, and a true one, that extremes never meet. The happy medium cannot be obtained in this way.

THE STALLION.

Purity of blood is the very first consideration in a stallion. He should not contain the slightest stain. It matters not whether he is a racer, a Suffolk, a Clydesdale, or any other sort, he must invariably be pure of his own breed. He will then suit for getting either pure or half-bred stock. He requires to be pure for mares of a mixed strain, because the first cross is by far the best. When the crossing is continued, the quality is certain to deteriorate. I have often heard people, after admiring a half-bred stallion, say they would put their common-bred mares to him, as he was just the sort of horse they would like to breed. Do they ever succeed on this plan? Certainly not. Their only chance of obtaining what they want is, to put their mares to a pure bred horse, and thus breed their colts on the same principle as the half-bred stallion himself was got. It has frequently struck me, that want of attention to this rule has been the means of bringing thorough-bred stallions, as well as short-horned bulls, into disrepute in country districts. The result of the first cross is often a good-looking animal. He is considered too good for castration, and consequently is kept for a sire. His apparent strength, good looks, and cheap price, added to a flaming pedi-

gree all on the one side, are sure to command the custom of the district. When the produce, however, comes to maturity, it is found to be of such an inferior class, that there is nothing but loss and disappointment. The foals may look well when they are covered with fat; but when they come to full size they are a sorry lot. I knew an instance where two or three parties praised a foal of this description. A shrewd countryman who was standing by said, "Had a wee; it will get like its own sort yet;" and so it did. The unfortunate breeders who follow this plan never think of laying the blame at the door of their own stupidity; but at once jump to the ridiculous conclusion, that the fault lies entirely in their having too much blood.

There are so many requisites to constitute a right good stallion, that he is extremely difficult to be found. His blood, soundness, temper, temperament, form, size, substance, action, and colour, must all be considered. If he is for getting racing stock, he requires to run close to the ground; but if he is to be used as the sire of hunters, roadsters, or harness-horses, he must be a free and easy stepper, and lift tolerably high. A stallion should not only have all the important points well made, but he should also have them with more than ordinary substance. In short, he ought to have a great deal to spare. I feel pretty confident that Touchstone owes a considerable part of his remarkable

success as a stallion to the fact of his having an excess of substance in his leading points. He has plenty to spare; and, therefore, throws power into his stock. It is rather remarkable, that his fillies should be very little worth, whilst his colts are of the first stamp. On the other hand, Priam was the sire of the renowned Crucifix, and several other celebrated mares, whilst his colts were altogether unknown to fame.

Whenever it can be accomplished, it is an excellent plan to breed from horses which are *proved* to be good stallions. Their racing qualities do not always correspond with their value in the stud. Blank and Old England were own-brothers, being got by the Godolphin Arabian out of the Little Hartley mare; Blank was a good stallion, although a bad racer: Old England was a capital runner, but a bad stallion. Again, Lath and Cade were by the Godolphin out of Roxana. Lath was a first-class racer, and a bad stallion; but Cade, who was an excellent stallion, could scarcely be called a racer at all. The far-famed Eclipse was by Marsk out of Spiletta. Spiletta started only once, when she was beaten; and Marsk was such a miserable racer, that when he was turned to the stud he covered in Dorsetshire at half-a-guinea, and was sold to Mr. Wildman for twenty guineas. Marsk proved himself so good a sire, however, that he afterwards covered at one hundred guineas a mare. Plenipoten-

tiary, Charles XII., The Colonel, Harkaway, Cotherstone, Launcelot, and Faugh-a-ballagh, were tip-top racers, but miserable stallions, considering the opportunities they possessed. Others, again, such as Eclipse, Highflyer, Waxy, Whalebone, Touchstone, and Orlando, were distinguished both as racers and stallions. The great point for the breeder is to choose a stallion that gets the right sort of stock; and if his mare happens to make a good hit with the horse he puts her to, he should go on in the same line. We know that Penelope produced Whalebone, Whisker, Woful, and Web, by Waxy; that Launcelot and Touchstone were got by Camel out of Banter; that Irish Bird-catcher and Faugh-a-ballagh were own-brothers; and that Pocahontas threw both Stockwell and Rataplan to The Baron. It is impossible to be certain of the value of a race-horse or a mare, for breeding-purposes, until they are proved. We may often come near the thing, but we will sometimes be disappointed. Crucifix and her dam, and the Hero and his dam, were sold for about twenty guineas the pair; and Martha Lynn, with Voltigeur in her belly, was refused at twenty-five pounds!! The value of a first-class thoroughbred brood mare may be imagined from the fact, that the Duke of Grafton's family cleared, according to Nimrod, about one hundred thousand pounds out of the produce of the renowned Prunella.

Sir Shafto Adair was so kind as to send me, in March, 1860, a copy of the pamphlet on "The Breeding of Domestic Animals," which was written by the late eminent surgeon, Mr. Cline of London. "When the male," says Mr. Cline, "is much larger than the female, the offspring is generally of an imperfect form. If the female be proportionally larger than the male, the offspring is of an improved form. . . . When it became the fashion in London to drive large bay horses, the farmers in Yorkshire put their mares to much larger stallions than usual, and thus did infinite mischief to their breed, by producing a race of small-chested, long-legged, large-boned, worthless animals."

I cannot agree with Mr. Cline in supposing that the female should have a proportional excess of size over the male, because this would be in opposition to the rule of nature. If we look over all creation, we will find the male decidedly preponderating in size over the female; and this should prevent us, in making our selections, from endeavouring to bring them both as near as possible to the same dimensions. But I do most heartily concur in the idea, that we should never attempt to rectify the diminutive size on the part of the dam, by putting her to an overgrown brute of a sire, after the example of the different breeders which are animadverted on in Mr. Cline's work. This plan

comes directly under the objections which I have made to violent crossing in general. It matters not whether we are endeavouring to improve one point or the whole body, we should never make the attempt by a violent cross. If we do, we are nearly certain to fail. In place of remedying the fault we have in view, we will spoil the whole, for want of proportion through the different parts. We cannot remedy defects by running to opposite extremes. The improvement must be by a gradual process, and carried out through a succession of generations. If we want to increase the size of a race of ponies, we will accomplish our object much better by putting the mares to large-sized, strong-built pony horses, than to horses sixteen or seventeen hands high. The first plan would retain the good qualities with an increase of size; the last would totally ruin the race. These observations are applicable in all cases. Let our attempts at improvement be made on a gradual scale, but never by an abrupt process.

I believe there is no horse for heavy draught at all to be compared to the Clydesdale. He is a fast walker, a strong puller, and he has a very hardy constitution. Cart stallions are more frequently faulty in their middle-piece, and in their feet, than anywhere else. If they are faulty on these points, they must certainly be avoided. It matters not what perfections

he may have in other places, if a horse has bad feet, a light heart, a weak back, and short back-ribs, he should always be ranked amongst the veriest of weeds.

ERRORS IN DRIVING.

THE common practice of laying on the whip at starting, and thus springing a spirited horse into sudden and rapid action, is liable to sprain the sinews, and if the ground be slippery, the poor animal is nearly certain of coming to his knees. I have often seen horses brought down in this way under their load. If a high-tempered but tender-mouthed horse is treated in this manner, whilst he is hauled up with a severe and powerful bit just as the whip is being laid on, he is very likely to acquire the habit of rusting. The whip makes him dash forward, the heavy curb-bit stops his progress, he is bewildered and becomes fractious, and then takes the convenient course of going backwards. The start should always be effected as gently as possible, and the horse should be reined with a very tender hand. There should also be a deal of caution used at the termination of the drive. It is much better to ease the momentum by degrees, than to compel the unfortunate animal to exert every muscle and sinew in his body, whilst he endeavours to stop his own progress and the

progress of the vehicle, by propping himself up for a strong resistance, when he is brought to a sudden stand. There is no necessity for finishing a drive as if life or death depended upon the last stride.

No horse should be driven with a tight rein. It is a great mistake to suppose that hard holding will keep him on his feet. It will only render his mouth so hard that the bit will be of little use to him, unless it is handled by a giant. A man with good touch and capabilities for driving, can keep a horse on his feet by merely feeling that there is a bit in the mouth. Some horses can bear to be driven against their bit, but others are so constructed that they cannot stand it without spoiling their method of going, and curtailing their stride. They will perhaps break their trot for a sort of half canter. Many horses have their mouths ruined by the way in which they are driven in single harness. The driver sits on one side of the vehicle—he strikes the horse on the same side; the horse flinches from the whip; one rein is pulled to keep him straight; and in the course of time his mouth is completely spoiled; whereas laying the whip occasionally over the horse on the off side from the driver would have kept him straight for the road from the first.

It may often be remarked, that in approaching a corner the driver takes his horse as far out from the

point of the corner as he can. He is then obliged, by a sudden pull on the rein, to make the turn so sharp, that he almost appears to be going round on a pivot, and the horse is impeded in his progress and broken in his action. But if the pull on the bit had been so gentle—which it should always be—as to inform the horse quietly of what was intended; and if the turn had been very gradually commenced from the centre of the road on the one side, and carried as close to the corner as safety would permit, and then finished on the road on the other side by a gradual and still longer sweep, the turn would scarcely have been felt; and the horse, being aware of what he was about, would have been safely conducted on his course, without curtailing his action and lessening his speed to any very marked extent.

TREATMENT OF COLIC.

I WOULD not presume to encroach on the province of the veterinarian, in relation to the treatment of disease in the horse. On the contrary, when anything goes astray in my own stables, which seldom happens, I at once have recourse to the advice of a properly qualified veterinary surgeon, if he is within my reach, in place of trusting to my own judgment; and I strongly re-

commend all my readers to adopt the same plan. The earlier proper advice is obtained, and the more carefully and faithfully the instructions given are carried out, the greater is the certainty of a favourable result. At the present time, however, I will venture to say a few words on the treatment of colic. I am impelled to this by the strong impression which has been made on my mind by the perusal of a pamphlet on the subject, which was kindly sent me by its author, Mr. Joseph Gamgee. The views therein inculcated are so plain and rational, and so consistent with the doctrines I hold in regard to the human subject, that I will place some of them before my readers.

Colic seldom, if ever, occurs in the horse except in connexion with a loaded state of the bowels, or the presence of undigested food in the stomach. Hence the very first indication of rational treatment is the administration of purgatives, to clear the digestive organs of all their irritating contents. On this plan, we strike at the foundation of disease, and remove the cause of all the mischief, and relief is nearly certain to ensue. Whereas, on the ordinary plan of merely relieving the symptoms by the exhibition of opium to deaden the sensibility of the parts to pain, the cause of the disease is overlooked and remains untouched, and obstinate constipation, accompanied with violent inflammation, is very likely to follow. Horses and cows are

often lost in this way. At the very outset, we should administer a good purgative by the mouth, and have recourse to the use of injections by the bowel. I believe the best purgative is a ball containing six drachms of *genuine* Barbadoes aloes, two drachms of ginger, and ten drops of oil of carraway; and Mr. Gamgee uses nothing for injections but plain warm water, in two-quart doses, and repeated at short intervals five or six times, as occasion may require. If I might venture to give an opinion of my own on this matter, I would recommend, in addition to the above treatment, the administration of one ounce of laudanum and one ounce of sweet spirit of nitre, unless the state of the bowels forbids it. If the constipation is great, the laudanum would only increase it, and therefore should not be given till the bowels are opened; but if the bowels are tolerably free, I would combine all the plans of treatment, and thus hit the disease on every point. The purgative ball and injection will carry off all offending matter; the laudanum will relieve the spasm and pain; and the sweet nitre will equalize the circulation by acting on the kidneys and skin.

The practice of forcing the horse to stand on his feet, or walk about, when labouring under a fit of colic, is most inhuman. The same remark is also applicable to the plan of exercising the horse during the time he is under the purgative action of a dose of physic. He

should be moved gently about before the medicine commences to operate, but never after. Do those barbarians who knock the animal about when enduring the pains of colic, or when suffering from the strong purgative action of medicine, ever think of what they are doing? If they were treated themselves on the same plan, under similar circumstances, they would soon come to their senses regarding the management of the unfortunate animal which is placed under their charge.

LAYING DOWN THE FOOT.

My third Letter on the Horse, published in the *Londonderry Standard* for the 10th of March, 1848, contained the following statement:—"I think any person who takes the trouble of opening his eyes may see, that the safety of the horse's knees depends entirely on the slant of the shoulder and pastern, together with *a proper method of laying down the foot*. . . . I assert, most emphatically, that it is the laying down, and not the lifting, of the foot, which renders the animal safe. If he lays *the heel first to the ground*, he cannot fall. . . . Let the horse with the well-slanted shoulder and pastern throw his foot far forward, *and lay his heel first to the ground*, and I will answer for his safety."

I here propounded, in a few words, *an entirely new view* of the horse's mode of progression. I never felt satisfied with the current opinion on the subject, as I was always convinced, from the time I was able to form an opinion of my own from practical observation, that the horse and all other inferior animals moved, like the man, from heel to toe. At the time I wrote, I thought the universal belief was that the foot should be laid down quite flat upon the road; but I learned in the year 1861, to my great astonishment, that a large portion of the veterinarians actually maintained that the toe was the part which should reach the ground first. Such an idea as this last never entered into my head, and it was with great difficulty I could believe, when informed of the fact in 1861, that any man in the exercise of his common sense could give credence to such a doctrine; and I am still at a loss to know what on earth could have given rise to such a view of progression—progression by going first backwards and then forwards!

I re-wrote these statements about laying down the heel in 1851, and published them again in 1859, exactly as they are to be found on the 88th and 89th pages of this work. The same sentiments were brought, in a clear, distinct, and extended form, before the notice of the veterinary profession by Mr. I. J.

Lupton, in the commencement of the year 1858, through the columns of the *Veterinarian;* and they were adopted and very ably advocated by Mr. Joseph Gamgee, in the *Edinburgh Veterinary Review* for January, 1859.

As I never had the advantages of a good, nor yet the very great disadvantages of an erroneous veterinary education, I was obliged, to a large extent, to pick up information regarding the horse from the use of my own eyes. Hence I do not recollect of having ever held any other opinion than the one I published in 1848, that the horse lays his heel first to the ground, and moves like the man, from heel to toe. Indeed it seems remarkable that veterinarians should have left the discovery of this view to me. Their having held the opposite opinion is quite unaccountable. To suppose that the horse should both light *on* the toe and lift *from* the toe—that the toe should be the first and last point of contact with the ground—appears an approach to absurdity. The toe would require to be made of something more durable than steel, to stand the tear and wear which would result from such an arrangement. Besides, this construction would involve a tedious and clumsy action, which is altogether inconsistent with the beautiful simplicity of natural organisation. Just imagine the time spent in laying down from toe to heel, and then lifting from heel to toe!

Any person who wishes to form an idea of this, may do so by trying the action with his own *hand* on a table. If he wants to go forward he will find it tedious, very clumsy, and difficult, when the points of the fingers are brought first into contact with the surface; but the very reverse is the case when the heel of the hand, if I may use such an expression, is laid first to the table.

My opponents will admit that the horse *sometimes* lays down the heel first. Now, I cannot understand how it is possible for him *ever* to do so without showing a decided halt or limp, *unless it is the natural and proper method.* It is easy to see that, although the heel ought to come first to the ground, it is possible for the toe, in some instances, to do so, in consequence of defective muscular action, or malformation. But if, on the other hand, the toe, or flat of the foot, should come first, the heel never could do so without a great and observable defect in motion. It would then be about as awkward for the horse to come first with his heel, as it would be for the man to come first with his toe. The reversion of the natural action, in either case, would be attended with such decided defects, that it could not possibly fail to attract attention. Now, what do we find as the result of observation? If we see a man walking with a firm, elastic, active, and powerful step, we will in-

variably observe him laying the heel to the ground first; but the infant, whose muscular power is insignificant, frequently uses its toes for a time before it can deposit the heel; and the very old man, who has lost his action, or the man who is suddenly cut down with severe illness, shuffles along the ground, and lays either his toes or the flat of his foot to the surface of the road. So is it with the horse. If we examine one which *evidently* brings his toe first to the ground, we will find that he is either over-weighted in draught, or is so much the worse of wear as to be nearly done, or that his form was originally bad, and his muscular power defective. On the other hand, I have seen hundreds of examples in which the horse brought his heel *quite perceptibly* first to the ground, and yet had a most powerful, active, energetic, light, safe, and corkey action. A horse of this kind, notwithstanding Mr. Dyer's opinion to the contrary, will stand an immense amount of wear. One of the greatest trotting horses I ever possessed, or indeed ever saw, was exactly of this description. There was no mistake about his laying the heel first to the ground; a half-blind man could not miss observing it; and yet, although he got an immense amount of work on the road, as all trotters will, as well as in his early day in the field, his fore-feet and legs were as sound at thirty-one years of age as when he was foaled. He

died in the year 1850, without ever having had a hair off his knees. A friend of mine in Coleraine has at present a pony, which I know to be twenty-seven years of age, and which, for more than twenty years, carried its master—a medical practitioner, and a heavy weight —on the road; and its legs, after all, were as sound as a bell, although it was a well-marked example of laying the heel first to the ground. I never passed it on the road without admiring the beautiful way in which it did deposit the heel on the ground. Its action in this respect was most beautiful. Hence one reason of its great lasting powers and capability of endurance.

There can be only one right method of laying down the foot. Whatever it is, every deviation from it must be a defect. This principle is so self-evident, that I would never think of reasoning with any person who would dispute it. The works of Nature are not so clumsy and ill-arranged, as that there is no definite method. Man *can* walk backwards; but the only natural and correct plan is forwards. They are not interchangeable. The one cannot be substituted for the other, with comfort, ease, and full speed. So is it with the horse, and every other animal. Each has a right method; and every deviation from it must be unnatural and defective. In regard to the horse, then, what is the correct plan? Let us just look at the three views,

toe, flat, and heel, which are at present before the public.

If the toe ought to come first, then the toe action *must* be by far the best, safest, and most comfortable—particularly when it is evident and well marked—and the heel action *must* be the greatest possible defect. Is it found to be the case that the evident toe-action is extremely good, and the evident heel-action extremely bad? Is there any really practical horseman in the world believes it? Is it not always found that striking the toe against the ground renders the horse so unsafe that the rider would require to have his life insured, if he has any regard to the welfare of his family?

Supposing that the foot should come right flat, stump, upon the ground, the centre of the foot must then be considered *practically* as the point of contact; and consequently, if a deviation from the natural position takes place at all, it must be a matter of perfect indifference whether it is the heel or the toe comes first. On this view they are both perfectly on a par, because it involves the idea of laying down and lifting a stump, and excludes progression by an elastic spring from heel to toe. Now, I ask, would those who advocate the flat position take a horse which plainly puts his toe first to the ground, as readily as the one which evidently brings down the heel? I am sure they would not. Still, to

be consistent with their own views, they ought to hold that a perfectly visible toe-action is quite as good as a perfectly visible heel-action. If any person will take the trouble of stooping down to the level of the road whilst he watches a *good*-actioned horse going down a hill, and if he plainly observes him laying the heel first to the road, as I have often done, he will never, by any chance, find him in the slightest degree impeded in his action by laying down the heel, but the very reverse. Then let him look at the other side of the picture, and see the unsafe, clumsy, tedious, and defective action of the horse which evidently sticks his toe into the ground, either up the hill, or on the level road. If the toe, or the flat of the foot, is brought first into contact with the road, the bones of the pastern and foot must be in such a position as to transmit the concussion right up to the body of the rider, and the action of the animal will be stilty in the very extreme; whereas an inspection of a perpendicular antero-posterior anatomical section of the foot and leg will demonstrate that the heel position allows the pasterns to assume the most favourable angle for breaking the shock and obviating concussion.

With regard to my plan, or the heel first, I would like to know how it is possible, even in theory, for it to produce either stilty, unsafe, impeded, or disagreeable action; and I would like to see the man who will

deliberately reject the horse for having such a method of going. I have never yet met a man so foolish as this comes to; but if I do ever meet him, I will send him up to the British Museum, as a specimen well worthy of preservation.

Mr. Paton and Mr. Dyer object to a comparison with man. If the comparison is put forward as a proof, they have every right to reject it, because proof can result only from careful, special *observation* on the horse himself; but if it is used merely as an illustration in connexion with previous observation, their objection does not hold good. For instance, when I wanted to account for the occasional deviation from the natural action, where the toe is laid first to the ground, it was quite allowable to take the example of man, in whom all parties agree to the heel first as natural, for the purpose of showing that even here we may sometimes have the toe or flat of the foot brought to the ground, as the result of debility or bad formation. No person would argue that the toe, or flat, is the natural action in man, because he is occasionally found to lay these parts first to the floor; neither should any man argue that the horse has no definite method, or that the toe, or flat, is the natural plan, merely because we sometimes find him planting these parts first upon the surface. The plan which, by observation, is found, in

all possible circumstances, to be consistent with free, safe, speedy, elastic, and powerful action, must be the natural one, and all deviations from it are defects. If any plan is ever proved inconsistent with good action, in a healthy state, it cannot be the natural one.

Those who object to the comparison with man, would do well to try their hand with those cases of animals walking on all fours, which have been adduced by Mr. Lupton and Mr. Gamgee. If, as alleged, the cow, dog, camel, and elephant, plant their heel first, why may not the horse do the same? If such action does not injure the former, why should it injure or impede the latter?

I confess I have little faith in the light to be derived from the forge in this question—a question which must be settled exclusively by practical observation on the horse whilst in action. Suppose I take up a shoe in the forge and find it greatly worn at the toe in comparison with the heel, am I justified, on that account, in concluding that the wearer of the shoe brought his toe to the ground first? Certainly not. If I did, I would just make as childish a mistake as the bootmaker would do, who would conclude that I did not place my own heel firmly on the ground, because I wear two or three pair of toes for one pair of heels on my boots. The fact is, it is not the laying down, but the *grinding* action of lifting, that wears the shoe.

In the work on *The Horse*, by Stonehenge and Lupton, which was published in the month of October, 1861, two pages are devoted to the consideration of the toe, and heel, action. In place of putting me down as the originator of the idea of the heel action in the year 1848, they have taken the entire credit of the matter to themselves. Their conduct in this affair is to be regretted much more on their own account than on mine. Stonehenge claims that he brought the view before the public in October, 1855, and Mr. Lupton, before the profession in 1858. There is no doubt Mr. Lupton stated the case very plainly in 1858; but it is exceedingly questionable whether the language used by Stonehenge in 1855, in his "British Rural Sports," page 526, will bear the construction he *now* wishes to put on it. At any rate, it is perfectly evident from his observations on stumbling, at the 533rd page of the same book, that the idea of the real heel action had not *then* entered into his imagination. In place of supporting the claim he now makes, his observations, on the last-mentioned page, prove that he had not the most remote conception of this mode of progression, and did not understand the subject. After supporting the exceedingly doubtful opinion that stumbling frequently occurs in the lifting of the foot, he says, "The next cause (of stumbling) is from the foot being put down too far back, and too much on the toe, so that

the pastern, instead of settling into its proper place behind the perpendicular of the foot, knuckles over in front." Now, in place of stating that, according to the idea of the heel action, the mistake arises from *ever* placing the toe on the ground till after the heel is deposited, he here states that it arises from putting down the foot "*too much* on the toe," which indisputably implies that he thought it ought to come *a little* on the toe. This view is fully borne out by what he says about settling the pastern in its place. On the old idea of the toe or flat first, the pastern always requires to settle back into its place; but on the plan of the heel first, the pastern is in its proper place before the foot touches the ground, and requires no settling at all. In short, it is as plain as possible Stonehenge knew nothing of the heel action in 1855. As far as I am concerned, however, it does not make the slightest difference what meaning could be taken out of the language he then used, because my views were published in the *Londonderry Standard* nearly *eight years* before his *Rural Sports* were written, and *ten years* before Mr. Lupton's paper appeared. Hence my claim for priority is incontrovertible, and my meaning, as conveyed in the words quoted at the commencement of this section, is beyond dispute. I republished the same sentiments at the 88th and 89th pages of the first edition of this work, in 1859; and again in the *Edin-*

burgh Veterinary Review, for August 1861. "Dr. Carson," says the Editor of the *Londonderry Standard* (August, 15th, 1861), "has published in the *Veterinary Review* a letter claiming on his own account historic priority in the matter, as he is justly entitled to do, on the evidence of our own newspaper files."

After all this it certainly required a good deal of assurance on the part of Stonehenge and Lupton to come out, as they did in October, 1861, with a claim of priority. They had then no excuse for ignoring the existence of my views, because Stonehenge, as Editor of "The Field," was sent a copy of my book, and Mr. Lupton must have seen my letter in the *Veterinary Review*. Under all the circumstances, I am compelled to regard their conduct as neither courteous nor honourable.

Again, at the 9th page of his last work, Stonehenge says regarding the fore-leg, "It does sometimes happen, however, that the toes are turned in or out without affecting the elbow." Now, I must request him to point out the place, either in his own writings or in the writings of other men, where this peculiarity was mentioned until it was published by me. If he is unable to do so, he must bear the reproach of appropriating my views, in this matter also, without acknowledgment.

THE END.